

# POPULAR Computing WEEKLY

Only 50p.

5-11 February 1987

Vol 6 No 6



## Lord of the Rings – the arcade game

see page 4 for details

### Beginners' Guide to Computing Part four

Computing: the future  
Micro languages

### GAMES

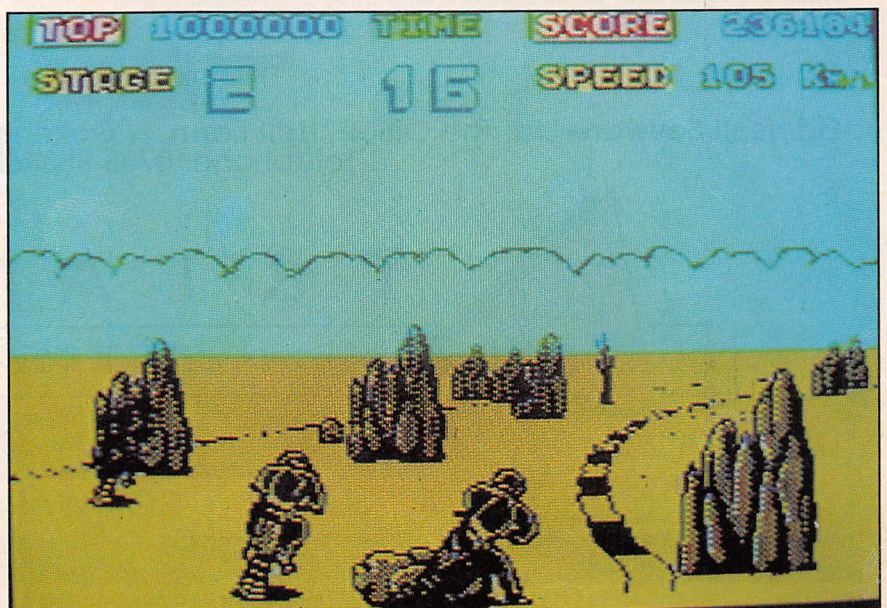
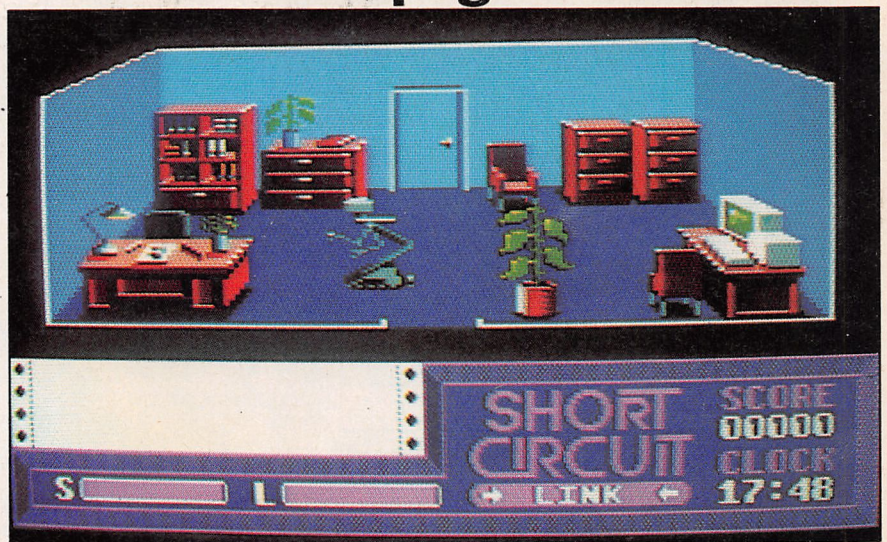
From the movies  
Short Circuit  
see Reviews

From the arcades  
Enduro Racer  
see Hotlines

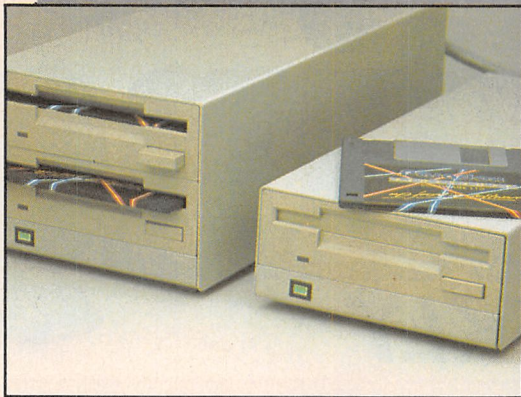
### NEWS DESK

ICI approves PC1512  
in company trials

Shortage of 16-bit  
programmers hits  
software houses







## TRIANGLE Floppy Disk Drives

ATARI ST™

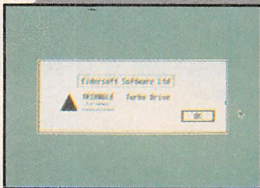
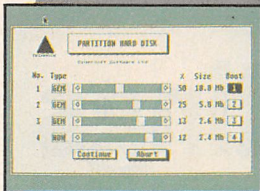
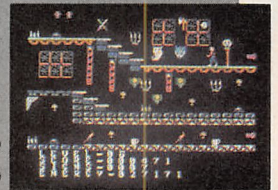
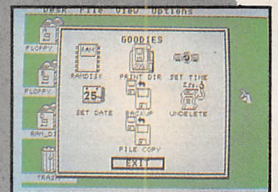
▶ These superb new 1MB Disk Drives use the very latest CMOS Technology from N.E.C., have a neat built in PSU and are colour matched and design co-ordinated with the Atari ST series of computers\*. Each unit comes complete with matching Gem Disk Utility Software and a **FREE ARCADE GAME!**

\* Triangle ST Floppy drives incorporate the very latest NEC units to ensure ST Compatibility. Each unit has 1 year full guarantee, full instructions and a system diskette.

1 x 1MB RRP £129

2 x 1MB RRP £209

PRICES EXCLUDING VAT



## TRIANGLE 20MB ST Turbo Drive

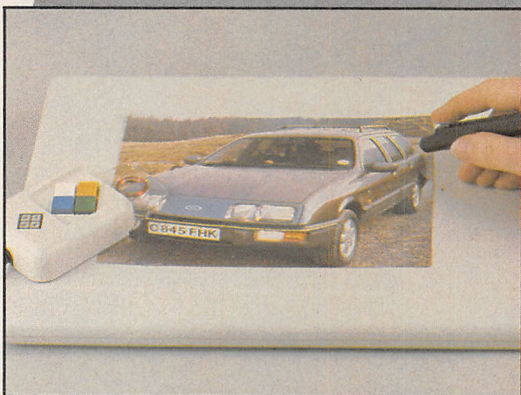
ATARI ST™

▶ This very fast 20MB Hard Disk Drive is mounted in a stylish co-ordinating unit that sits under the ST's monitor. Full Gem partitioning, and disk caching utility software. An Autoboot Computer Concepts backpack (£49.95) and flash-bak high speed backup utility (£39.95) are available as optional extras. A 20MB unit with built in 1MB floppy drive is also available.

20 MB £599

Soon with Built in 1MB Floppy Disk £759

PRICES EXCLUDING VAT



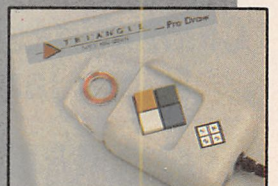
## TRIANGLE Pro-Draw Graphics Tablet

ATARI ST™ & AMIGA

▶ Pro-Draw is a professional 9 x 6" high resolution graphics tablet for the Atari ST and Commodore Amiga. Pro-Draw is compatible with most ST/Amiga graphics software and the ST Version has been specially interfaced to Mirrorsoft Art and Film Director (available from Eidersoft). Pro-Draw can also be used with IBM™ EGA utilities, with suitable software. Each unit comes complete with PSU, software and stylus. A cross hair puck (£59.95), and A3 tablet are available as optional extras.

ATARI £299 AMIGA £313

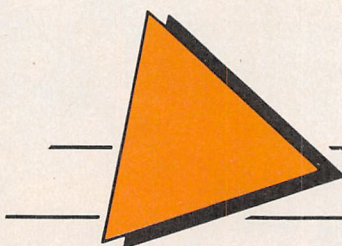
PRICES EXCLUDING VAT



Triangle professional hardware is available now from selected dealers (contact us for a list) in the UK or direct from Eidersoft at the address below. If you would like full technical information, don't forget to ask for our product data sheets or PD Demo Disk with **FREE GAME** and **Impressive Demo's** (please send £1.95 or diskette and SAE).



Eidersoft Software Ltd, The Office, Hall Farm, N Ockendon, Upminster, Essex RM14 3QH.  
Telephone: 0708 856468



# TRIANGLE

SOFT INNOVATION

EIDERSOFT

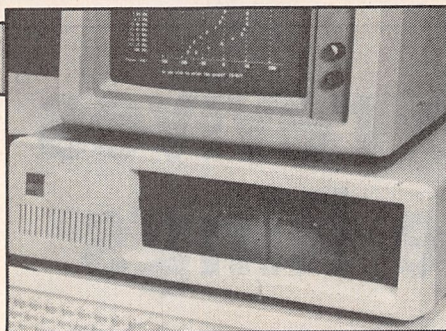
SOFTWARE LTD.



## SOFTWARE ►

**11 Tasword PC**

The Tasman conversion machine has rolled into action again, with the implementation of *Tasword* for PC compatibles. At £24.95, it certainly undercuts most of the 'industry standards' in this field.



## ◀ HARDWARE

**11 Printer IV Rom**

Give your Commodore MPS 801 printer a new look with some alternative typefaces. Datel Electronics' Printer IV Rom has four new character sets, and Chris Jenkins found it easy to install and use.

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Christina Erskine takes an inside look at mending faulty micros, courtesy of repair company Verran.

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SPECIAL  
SUPPLEMENT**Beginners' Guide  
to Computing**

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languages**

Alternatives to Basic – Pascal, Logo, Forth, BCPL, Lisp, Prolog and many more strange acronyms explained.

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It may be ten years old, but the CP/M operating system has had a renaissance of late with Amstrad, among others, implementing it on a number of machines.

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Recreate the razzmatazz of Super-bowl with the third part of Duncan Evans' American Football game.

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Get your files sorted out.

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Letting the computer take the strain of listing data elements.

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# Melbourne revives Lord of the Rings

MELBOURNE House has announced the development of a further product based on Tolkien's classic fantasy novel, under the working title of *Lord of the Rings - The Arcade Game*.

With launch scheduled for around June, the title certainly has the potential to replicate the 1985 mid-summer success from the Australian based company, *Way of the Exploding Fist*, but this time, development is being firmly located in the UK.

Rachel Davies, the company's marketing manager de-

scribes the game as "a huge title. It's a strategy/arcade game based on the whole works," she commented. "It'll allow you to fight all the wars, battles and individual combats in the whole of Lord of the Rings."

The game, which uses the whole of Middle Earth as the playing area, is one player only, with you controlling the forces of good via joystick against the computer controlled opposition of Sauron and Saruman. The system will also include independent characters who can be in-

fluenced by the actions of the player.

Programmed by the Merseyside-based Consult Computer Systems, with the original scenario designed by Mike Singleton, work is already in progress.

"It's got a lot of new things in it," enthused David Kelly of Consult, "a lot of things that have never been done before."

No price for the game has yet been set, but it will certainly be appearing on Spectrum, Amstrad CPC and Commodore 64 formats.

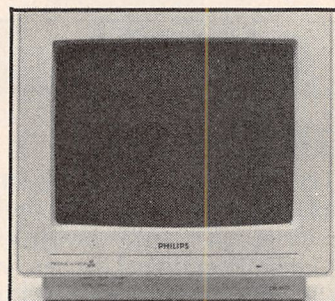
## Supersoft's Pets

SUPERSOFT is blasting from the past with the release of two new products for the Commodore Pet, one of Commodore's first machines in the UK, originally launched in 1978.

*Blitz* is a Basic compiler which, claims Supersoft, will enable programs to run up to 20 times faster. It costs £113.85. *Fast Copy* is a disc back-up utility at £17.25.

Details from Supersoft, Winchester House, Canning Road, Wealdstone, Harrow, Middlesex HA3 7SJ.

## New monitors from Philips



PHILIPS is to launch a new series of colour monitors at the *Which Computer?* show later this month.

The 88 range comprises three models, the CM8833, CM8852 and CM8873, all with 14 inch screens and RGB input. For PC compatible users, the monitors will all support IBM CGA, EGA and VGA graphics cards.

Prices range from £314.95 for the CM8833, which has a composite video as well as RGB input, to £650 for the high resolution CM8873.

## Silica cuts cost of Easy Draw

SILICA Shop has now reduced the price of Atari ST *Easy Draw* by US company MiGraph (see *Popular Computing Weekly*, Software, January 22). The product now costs £79.95.

For details and a full catalogue of all Atari ST software distributed by Silica Shop, contact the company at 1-4 The Mews, Hatherley Road, Sidcup, Kent DA14 4DX (01-309 0300).

# ICI approves PC1512



INTERNATIONAL chemical giant ICI has now completed trials on Amstrad PC1512 range and has approved the machines for purchase by ICI's operating units.

It was reports in the national press of ICI's supposed dissatisfaction with the Amstrad PCs and possibilities of overheating, which led Alan Sugar to take the decision to install fans in the computers - although he advised users to turn them off.

ICI reports that during the trials it found no problems with overheating, and that the software compatibility was excellent.

● The decision comes at a good time for Amstrad. City analysts are currently predicting a sharp upturn in profits. Amstrad has been awarded a high court injunction against a Michael John Hancox and his company, which was calling itself Amstrad Computers Ltd. The company must stop using the name Amstrad, and damages are currently being assessed.

Amstrad also has a number of outstanding court actions in progress against people and companies which have been using the Amstrad name and logo.

## Video disc games for Virgin

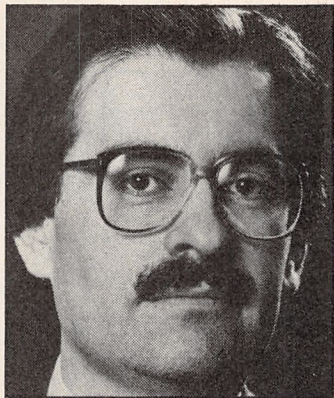
VIRGIN Games is currently compiling its first video disc-based game based on Sir Ranulph Fiennes' three-year expedition which crossed both the south and north poles.

Taken from 90 hours of footage shot from the expedition itself, the game involves the player organising the polar sections of the trip.

It will run on the same hardware as the Domesday disc, and is being partly targeted at the educational market.

Virgin is also planning to expand into the business software field this year. As part of the development of the company, a general manager has been appointed at

Virgin Games. Paul Latham comes to the company with considerable experience of the toy industry and will report to Virgin Games' MD Nick Alexander.



Paul Latham



# Programmers for 16-bit machines in short supply

AS the 16-bit machines begin to sell in increasing numbers, software companies are finding it difficult to attract calibre programmers to write games for machines such as the Atari ST, Amiga and PC compatibles.

The feeling is that because



The Amiga: "difficult"

the machines are still comparatively new, programmers are inexperienced at using the machines' capabilities to the full.

"It's very hard to find 68000 freelancers or programming teams which can put out a good product," said Jon Baldachin of Virgin Games. "From CVs we get, most have experience of Unix, C, or machine code on the 68000, but not in games. And there are very few 8086 games programmers, al-

though we believe there is a demand for IBM games."

Both Palace Software and Creative Sparks, which are actively looking for 16-bit programmers, had much the same tale to tell.

"We've found a few good ones, but we're talking in ones and twos," said Pete Stone, who heads Palace. "The machines are so new to this marketplace that not many people have real experience, and the Amiga especially needs a long time to get to know."

Leigh Richards of Creative Sparks agreed that game writing experience was the sticking point. "There are plenty of 16-bit programmers, but say to them, 'now do a game', and they don't know where to start. Still, if they can do the work, the software house can advise on storyline and gameplay."

Many companies are looking to the Atari ST and cheap PC compatibles to sell particularly well this year, and feel that this is where the next mass market lies. However, while it is an old adage that says a new machine will only sell in volume when the software base has built up, one can also add that the software can only appear in quantity when the programmers have got to grips with the hardware.

## Low cost Dbase II for Amstrad PC owners

ASHTON-Tate's *DBase II*, widely regarded as the industry standard database, is being made available at a specially discounted price through First Publishing.

The new deal between First and Ashton-Tate applies to the MS-DOS version (First already handles a reduced price CP/M version) and is aimed specifically at Amstrad PC

owners.

Buyers must provide proof of purchase of an Amstrad PC.

In this offer *DBase II* will be available from First at £119, instead of the £300-£400 normally charged.

Details from First Publishing at Unit 202, Horseshoe Park, Horseshoe Road, Pangbourne, Berks.

## Software Hotlines

I think Liverpool is taking over the world. Merseyside certainly has the highest concentration of quality programmers in the country. **Denton Designs, Canvas** – which sprang from its loins, **Odin, Software Projects** – all names we've come to know and... well, we know them anyway.

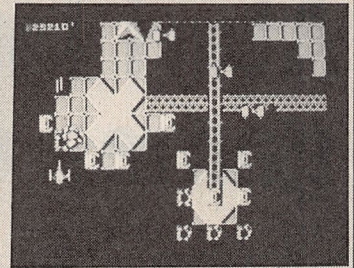
Betcha never heard of **Consult Computer Systems**, though. You soon will.

Incensed by my brutally insensitive remarks in *Hotlines*, 22 January (unknowingly referring to Consult et al as Mike Singleton's underlings), David Kelly and Glenn Benson, accompanied by Dave Sharpe and Richard Whelan, came down to sort me out.

In fact, **Consult** is a nine-strong production team set up in April this year that have been hard at it, doing behind the scenes work on games like *Psi 5 Trading Co* and *Asterix*, with their major works *Dark Sceptre* and *Throne of Fire* (both written in conjunction with Mike) only just about to come to light.

Yes! *Dark Sceptre* is finished! **Consult** gets very excited when talking about it – but **Beyond** has yet to make a decision on a release date.

**Melbourne House** is sticking to April 9 for *Throne of Fire* (Spectrum and Commodore), with Amstrad to follow soon after, and *Lord of the Rings (The Arcade Game)* to follow around June.



Firetrax

In fact, although the game certainly has arcade elements, it'll also include bags of strategy, with the playing area covering the whole of Middle Earth. Phew!

**Activision** and **Electric Dreams** are also going to be busy over the next couple of months, with some fabby stuff coming off the production line.

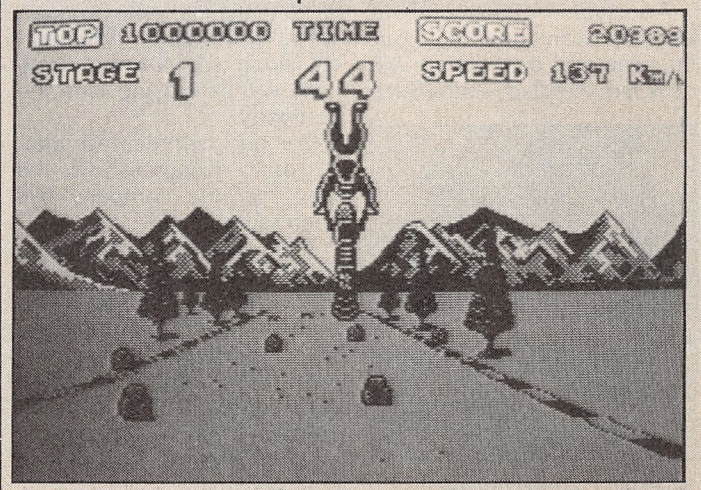
*Enduro Racer* – possibly the best coin-op conversion ever (congrats to Nick Cooke and **Focus Graphics** for the obvious) – will be with us in mid-February, with *Star Raiders II* on all formats, and *Hi-jack* on the 64 soon after.

Most exciting, however, is a shoot 'em up – *Firetrax* on Commodore 64 and BBC, an **Electric Dreams** title that'll be appearing around Feb/March time.

Programmed by the legendary Orlando, who we can exclusively reveal is actually Nick Pelling (who wrote *Xalaga* and *Frak* on the BBC), this is a game so violent you don't even have to press the fire button to fire your laser. It has a marvellous instant appeal, and is destined to rank with *Uridium* amongst the all-time greats. Promise.

John Cook

*Enduro Racer* – best coin-op conversion?





# Atari launches new games console

ATARI has now abandoned plans to include the 7800 games console as part of its UK product range this year. A spokesman for Atari UK said, "There may be a few around in the trade, but it certainly isn't a major part of our plans."

The 7800 has been ousted by the launch of a 65XE machine at the International Toy and Hobby Fair at London's Earls Court this week.

The plan is to launch the 65XE as a games console upgradable to a computer, with the purchase of an attachable keyboard. The console itself will cost £89.95; the console plus keyboard, effectively making it a 64K version of the 130XE, £129.95 (the same price as the 130XE). Atari currently intends to release it in April.

The spokesman continued that Atari's UK hardware range for 1987 was now more or less fixed, from the 2600 video console up to a desk-top publishing system including the ST and laser printer, to be launched in Europe at this spring's Hanover Fair.

In between, Atari will be selling the 65XE, 130XE, 520STFM, 1040STF, the Mega STs, and two versions of the Atari PC, unveiled at CES in Las Vegas last month (see *Popular*, January 15).

"The PC will be sold at two price points," said the spokesman. "One is aimed at the home user and will probably not have the EGA board, while the other will have EGA and a special monochrome monitor with 16 grey tones, aimed at the small business user." Exact prices in pounds sterling are still unclear.

## Epson to open UK plant following price increases

EPSON, the leading printer manufacturer, is to open a British factory this summer.

The plant, to be opened at Telford in June, will employ more than 100 people and the initial production target is 10,000 printers per month.

The move follows two recent developments.

First, Epson had announced price increases of between five and 15 per cent on some printer models, blaming the falling strength of the pound against the yen (also Amstrad's reason for raising prices on the PC1512).

Second, the EEC is believed

to be considering action against some Japanese companies for dumping – selling printers in Europe at less than manufacturing cost.

Epson denies any link between the EEC investigation and its Telford plans, and a spokesman said that it was unlikely that the UK plant would allow it to cut prices in the short term.

However, he added: "It's two-and-a-half years since prices were increased on our high-volume models. UK manufacturing obviously gives us a better opportunity to keep prices stable."

## Seven staff go as Ariola reorganises

ARIOLASOFT'S German parent company has taken the first steps in a major reconstruction of the UK division.

Ariolasoft UK will continue as a software publisher, but its sales and distribution will now be handled elsewhere,

probably in a tie-in with another software company.

Seven staff have been made redundant, including sales manager Frank Brunger, who co-founded Ariolasoft UK along with Ashley Grey. Grey will be staying with the company.

Brunger commented that: "I totally disagree with the way that the company has been reorganised."

The Sega games machine, which Ariolasoft was to sell this year, will now be distributed by whichever company takes on the rest of its products. The Sega has been delayed, according to Frank Brunger, "because we are still arguing with the Japanese over pricing."



Brunger, "I totally disagree"

## DIARY DATES

### FEBRUARY

17–20 February

**Which Computer? Show**

NEC, Birmingham

**Details:** Mainly business exhibitors

**Price:** £5

**Organiser:** Cahners Exhibitions, 01-891 5051

### MARCH

20–22 March

**The Electron & BBC Micro User Show**

UMIST, Manchester

**Details:** Software, hardware and peripherals for Acorn's micros

**Price:** £3 adult, £2 children, £1 discount for advance booking

**Organiser:** Database Exhibitions, 061-456 8835

### APRIL

24–26 April

**The Atari Computer Show**

Novotel, London W6

**Details:** First chance for Atari to show off exciting new strategy

**Price:** £3 adult, £2 children, £1 discount for advance booking

**Organiser:** Database Exhibitions, 061-456 8835

### MAY

8–10 May

**The Electron & BBC Micro User Show**

New Horticultural Hall, London

**Details:** Software, hardware and peripherals for Acorn's micros

**Price:** £3 adult, £2 children, £1 discount for advance booking

**Organiser:** Database Exhibitions, 061-456 8835

### JUNE

12–14 June

**The Commodore Computer Show**

Novotel, London W6

**Details:** Software, hardware and peripherals for Commodore range of machines

**Price:** £3 adult, £2 children, £1 discount for advance booking

**Organiser:** Database Exhibitions, 061-456 8835

## Quill enhancer at Microfair

AN estimated 5,000 enthusiasts attended the first Microfair of 1987 at the Horticultural Hall in London last Saturday, to scour the 80 odd stands of assorted software and hardware for the Sinclair machines.

The exhibitors ranged from cut-price software merchants through established games and utility houses to hardware manufacturers, with disc-based expansions particularly in evidence.

Highlights included the first showing of *Professional Adventure Writer* from Gilsoft, an advanced writing system. Features over and above the *Quill* include an advanced parser and extra text compression.

Prices, dates and venues of shows can vary, and you are therefore strongly advised to check with the show organiser before attending. *Popular Computing Weekly* cannot accept responsibility for any alterations to show arrangements made by the organiser.



# TECHNOLOGY SO ADVANCED ...

## MEMORY

- \* 512Kbytes RAM (520ST-M, FM)
- \* 1024Kbytes RAM (1040ST-F)
- \* 192Kbytes ROM
- \* 128Kbytes external plug-in ROM option

## ARCHITECTURE

- \* Motorola 68000 Central Processing Unit (CPU) with a clock speed of 8MHz
- \* 16-bit external data bus
- \* 32-bit internal data bus
- \* 24-bit address bus
- \* 8x32-bit data & address registers
- \* 7 levels of interrupts
- \* 56 instructions
- \* 14 addressing modes
- \* 5 data types
- \* DMA (Direct Memory Access)
- \* real time clock as standard

## GRAPHICS

- \* full bit-map display
- \* palette of 512 colours
- Using Atari Monitors (on 520 & 1040):
- \* 640x400 high resolution - monochrome
- \* 640x200 medium resolution - 4 colours
- \* 320x200 low resolution - 16 colours
- \* 80 column text display (40 col low res)
- Using Domestic TV (on 520):
- \* 640x200 medium resolution - 4 colours
- \* 320x200 low resolution - 16 colours
- \* 40 columns x 25 line text display

## SOUND AND MUSIC

- \* 3 programmable sound channels
- \* frequency programmable 30KHz - 125KHz
- \* programmable volume
- \* wave & dynamic envelope shaping
- \* programmable attack, decay, sustain, release
- \* Musical Instrument Digital Interface (MIDI)
- \* MIDI allows connection of synthesizers etc.

## STANDARD SOFTWARE

- \* GEM desktop + TOS operating system
- \* ST BASIC interpreter/language system

## MOUSE

- \* high precision
- \* 2 button control
- \* free with 520ST-FM/1040ST-F
- \* non slip ball motion sensor
- \* removable ball for easy cleaning

## INPUT/OUTPUT

- \* MIDI out ..... (5 pin DIN) 31.25K baud
- \* MIDI in ..... (5 pin DIN) 31.25K baud
- \* audio out ..... 1.0V DC peak to peak, 10K ohm
- \* audio in ..... 1.0V DC peak to peak, 10K ohm
- \* RGB monitor ..... 1.0V DC, 75 ohm
- \* mono monitor ..... 1.0V DC, 75 ohm
- \* mono horizontal scan rate ..... 35.7KHz
- \* mono vertical scan rate ..... 71.2KHz
- \* sync ..... 5V DC (active low) 3.3K ohm
- \* modem/serial ..... RS232C, 50 to 19,200 baud
- \* floppy disk ..... 250 Kbits/s
- \* hard disk ..... 11.3 Mbits/s
- \* mouse ..... standard Atari connector
- \* joystick ..... standard Atari connector
- \* cartridge port ..... 128K capacity
- \* RF output (520ST-FM) ..... for TV use

## OPERATING SYSTEM

- \* TOS with GEM environment in ROM
- \* hierarchical file structure with sub-directories and path names
- \* user interface via GEM, with self explanatory command functions
- \* multiple windows + icons
- \* window resizing, re-positioning and erasing
- \* drop down menus (selected by mouse)
- \* GEM virtual device interface

## COMMUNICATIONS

- \* RS-232C serial modem port
- \* 8-bit parallel printer port
- \* MIDI port (also for networking use)
- \* VT52 terminal emulation

## KEYBOARD

- \* standard QWERTY typewriter format
- \* 95 full stroke keys
- \* 10 function keys
- \* 18 key numeric keypad + cursor keys
- \* variable auto-repeat & key click response
- \* keyboard processor reduces CPU overhead

# ... IT'S AFFORDABLE

## ONLY FROM SILICA

Finally, there's a personal computer that not only solves problems like other computers, but also solves the one problem that other computers have created. Affordability. Silica Shop are pleased to present the ST range of personal/business computers from Atari. The ST was designed utilizing the most recent breakthroughs in semiconductor technology, producing a personal computer that performs tasks with fewer parts. Which means it costs less to make. And less to buy. The latest ST computers now include built in power supplies and built in disk drives. The TOS operating system and GEM window environment are now on ROM chips which are already installed in the ST keyboard. This enables automatic instant booting when you switch on. Silica Shop are pleased to offer the complete Atari ST range. Our mail order department is situated in Sidcup and we have 4 retail outlets at Sidcup, Orpington, Lion House (Tottenham Court Rd) and Selfridges (Oxford Street). We have eight years experience of Atari products, longer than any other UK company, and are well established as the UK's No.1 Atari specialist. With a group turnover of over £5 million and in excess of 70 staff, we provide unbeatable service and support. We provide several facilities which you will find invaluable during your Atari computing life and most of these facilities are available **ONLY FROM SILICA**. We suggest that you read through what we have to offer, before you decide where to purchase your Atari ST.

### FREE STARTER KIT - Only From Silica

When you purchase any Atari ST keyboard, you will not only receive the best value for money computer on the market, but you will also receive the following from Atari Corporation as part of the package:

- \* BASIC Language Disk
- \* BASIC Manual
- \* ST Owners Manual
- \* TOS/GEM on ROM

If you buy your ST from Silica Shop, you will also receive:

- \* NEOchrome - colour graphics program
- \* 1st Word - Word Processor

In addition, we at Silica would like to see you get off to a flying start with your new computer, so we have put together a special **ST STARTER KIT** worth over £100, which we are giving away **FREE OF CHARGE** with every ST computer purchased at our normal retail prices. This kit is available **ONLY FROM SILICA**, and is aimed at providing users with a valuable introduction to the world of computing. We are continually upgrading the ST Starter Kit, which contains public domain and other licensed software, as well as books, magazines and accessories all relevant to ST computing. Return the coupon below for full details.

### DEDICATED SERVICING - Only From Silica

At Silica Shop, we have a dedicated service department of five full time Atari trained technical staff. This team is totally dedicated to servicing Atari computer products. Their accumulated knowledge, skill and experience makes them second to none in their field. You can be sure that any work carried out by them is of the highest standard. A standard of servicing which we believe you will find **ONLY FROM SILICA**. In addition to providing full servicing facilities for Atari ST computers (both in and out of warranty), our team is also able to core memory and modulator upgrades to ST computers.

**1Mb RAM UPGRADE:** Our upgrade on the standard Atari 520ST-M or 520ST-FM keyboard will increase the memory from 512k to a massive 1024K. It has a full 1 year warranty and is available from Silica at an additional retail price of only £86.99 (+VAT = £100).

**TV MODULATOR UPGRADE:** Silica can upgrade the 1040ST-F to include a TV modulator so that you can then use it with your TV set. This is an internal upgrade and does not involve any untidy external boxes. A cable to connect your ST to any domestic TV is included in the price of the upgrade which is only £49 (inc VAT). The upgrade is also available for early 520ST computers at the same price.

### THE FULL STOCK RANGE - Only From Silica

We aim to keep stocks of all Atari related products and our warehouse carries a stock of £½ million. We import many software titles direct from the USA and you will find that we have new releases in advance of many of our competitors. Unlike dealers who may only stock select titles, we have the full range. In addition, we carry a complete line of all books which have been written about the Atari ST. A range as wide as ours is something you will find is available **ONLY FROM SILICA**.

### AFTER SALES SUPPORT - Only From Silica

Rest assured that when you buy your ST from Silica Shop, you will be fully supported. Our free mailings give news of releases and developments. This will help to keep you fully up to date with what's happening in the Atari market. And in addition, our sales staff are at the end of a telephone line to service all of your Atari requirements. If you purchase an ST from Silica and would like any programming or technical advice, we have a full time technical support team to help you get the best from your computer. Because we have both the staff and the systems specifically dedicated to providing after sales service on Atari ST computers, we are confident that our users enjoy an exceptionally high level of support. This can be received **ONLY FROM SILICA**.

### FREE CATALOGUES - Only From Silica

At Silica Shop, we recognise that serious users require an in-depth information service, which is why we mail free newsletters and price lists to our ST owners. These are up to 48 pages long and are crammed with technical details as well as special offers and product descriptions. If you have already purchased an ST and would like to have your name added to our mailing list, please complete the coupon & return it to us. The information service is available **ONLY FROM SILICA**.

### FREE OVERNIGHT DELIVERY - From Silica

Most orders are processed through our computer within 24 hours of receiving them. Most hardware orders are sent by the overnight METRO courier service **FREE OF CHARGE** to customers within the UK. This method helps to ensure minimum delay and maximum protection.

### PRICE MATCH - Only From Silica

We hope that the combination of our low prices, FREE UK delivery service, FREE Starter Kit and FREE after sales support, will be enough to make you buy your Atari equipment from Silica Shop. If however, there is something you wish to purchase, and you find one of our competitors offering it at a lower price, then please contact our sales department, providing us with our competitor's name, address and telephone number. If our competitor has the goods in stock, we will normally match the offer (on a 'same product - same price' basis) and still provide you with our normal free delivery. We realise that we are not the only company who will match a competitor's price. However, if you come to us for a price match, you will also be entitled to our after sales service, including free newsletters and technical support. This makes our price match promise rather special, something you will receive **ONLY FROM SILICA**. We don't want you to go anywhere else for your Atari products. So shop at Silica, the UK's No.1 Atari Specialist.

**SIDCUP (& Mail Order)** 01-309 1111  
1-4 The Mews, Hatherley Road, Sidcup, Kent, DA14 4DX

**LONDON** 01-580 4839  
Lion House (1st floor), 227 Tottenham Court Rd, London, W1

**LONDON** 01-629 1234 ext 3677  
Selfridges (1st floor), Oxford Street, London, W1A 1AB

## 520ST-M

The affordability of Atari computers is reflected in the price of the 520ST-M keyboard, which is a mere £259 (inc VAT). This version of the ST comes with 512K RAM, as well as a modulator and lead for direct connection to any domestic TV. The price does not include a mouse. In addition, when you buy your 520ST-M from Silica, you will also receive the FREE Silica 'ST Starter Kit'. During 1987, many software houses will be producing games software on ROM cartridges, which will plug directly into the cartridge slot on the 520ST-M keyboard, giving instant loading without the expense of purchasing a disk drive. With the enormous power of the ST, you can expect some excellent titles to be produced, making this the ultimate games machine! If your requirement is for a terminal, then the 520ST-M can fulfill this role too. Leads are available to connect the ST to a variety of monitors, and with the imminent introduction of terminal software on ROM cartridge, the ST provides a low price terminal for business use. If you wish to take advantage of the massive range of disk software available for the ST range, you will need to purchase a disk drive. Atari have two floppy disk drives available, a ½ Mbyte model £149 and a 1Mbyte model £199. Full details of these drives, as well as the Atari 20Mbyte hard disk are available on request. If required at a later date, the mouse may be purchased separately.

# £259

## 520ST-FM

The 520ST-FM with 512K RAM and free mouse, represents a further breakthrough by Atari Corporation in the world of high power, low cost personal computing. This model is the latest addition to the ST family, and is not only powerful, but compact. It is priced at only £399 (inc VAT) a level which brings it within the reach of a whole new generation of computer enthusiasts. When purchased from us, it comes with the FREE Silica 'ST Starter Kit' see paragraph on the left. To make the 520ST-FM ready for use straight away, Atari have built into the keyboard a ½ megabyte disk drive for information storage and retrieval, allowing you easy access to the massive range of disk based software which is available for the ST. This new computer comes with all the correct cables and connections you will need to plug it straight into any standard domestic television set. You do not therefore have to purchase an Atari monitor. If you do require a monitor however, these are available with the 520ST in the following money saving packages:

- 520ST-FM Keyboard - Without Monitor - £399 (inc VAT)
- 520ST-FM Keyboard + High res mono monitor - £499 (inc VAT)
- 520ST-FM Keyboard + Low res colour monitor - £599 (inc VAT)
- 520ST-FM Keyboard + Med res colour monitor - £699 (inc VAT)

Because the 520ST-FM has its own power transformer built into the keyboard, there are no messy external adaptors to clutter up your desk space. You are left with only one mains lead, serving both the disk drive and the computer. You couldn't ask for a more stylish and compact unit.

# £399

## 1040ST-F

For the businessman and the more serious home user, Atari have their most powerful model, the 1040ST-F with 1028K RAM. This low cost powerhouse can be introduced into a business environment as a stand-alone system, or can support a mainframe computer as a terminal. The 1040ST-F not only features twice as much memory as the 520ST-FM, but also includes a more powerful built-in disk drive. The drive featured on the 1040ST-F is a one megabyte double sided model. The extra memory facility of the 1040ST-F makes it ideal for applications such as large databases or spreadsheets. Like the 520ST-FM, the 1040ST-F has a mains transformer built into the console to give a compact and stylish unit with only one mains lead. The 1040ST-F is also supplied from Silica Shop with a free software package and 'ST STARTER KIT'. In the USA, the 1040ST-F has been sold with a TV modulator like the 520ST-FM. However, for the UK market, Atari are manufacturing the 1040ST-F solely with business use in mind and it does not currently include an RF modulator, this means that you cannot use it with a domestic TV (Silica Shop do offer a modulator upgrade for only £49). The 1040ST-F keyboard costs only £599 (inc VAT) and, unless a modulator upgrade is fitted, will require an Atari or third party monitor. There are three Atari monitors available and the prices for the 1040 with these monitors are as follows:

- 1040ST-F Keyboard - Without Monitor - £599 (inc VAT)
- 1040ST-F Keyboard + High res mono monitor - £699 (inc VAT)
- 1040ST-F Keyboard + Low res colour monitor - £799 (inc VAT)
- 1040ST-F Keyboard + Med res colour monitor - £899 (inc VAT)

The 1040ST-F comes with a mouse controller and includes 1Mbyte of RAM. It has a 1Mbyte double sided disk drive and mains transformer, both built into the keyboard to give a compact and stylish unit, with only one mains lead.

# £599

# ATARI ST

To: Silica Shop Ltd, Dept PCWK 0287, 1-4 The Mews, Hatherley Road, Sidcup, Kent, DA14 4DX

**PLEASE SEND ME FREE LITERATURE ON THE ATARI ST**

Mr/Mrs/Ms: ..... Initials: ..... Surname: .....

Address: .....

.....

.....

Postcode: .....

Do you already own a computer

If so, which one do you own? .....





## Facts over fiction

I was very interested in your Letters pages in *Popular*, 15 January.

Firstly, I noted the comments by "Disgusted" from Somerset regarding your negative attitudes towards the MSX range of computers. Unfortunately you seem to be carrying this attitude over to the Commodore Amiga.

The Atari ST is getting plenty of exposure in the magazine yet the Amiga is only occasionally mentioned, and then only very grudgingly.

However, both are excellent machines, so let's have a more impartial level of coverage for each.

Secondly, regarding your comments at the bottom of Förrn Innset's letter, the Commodore Amiga *is* catching on in the UK and the software base *is* expanding rapidly, so perhaps you could present facts rather than personal opinions in future.

Thirdly, why all the fuss about the Amstrad range, especially the PC? What's so exciting about obsolete technology. Let's concentrate on the front runners, such as the Atari ST, Amiga and the forthcoming Apple range.

Finally, with regard to your reply to Ivan Wilson's query about Commodore 1571 compatibility, other programs

which fail to load are *Alternate Reality*, *Goonies*, and many USA special fast loaders.

Normally the problem only occurs with 'oh so clever' software protection which was designed to directly access the 1541 disc drive Rom, and fails when used with the 1571.

C R Elsdon  
Attleborough  
Norfolk

## Silica shop shines

As a 'typical' computer user, I have programmed from a Vic 20 (£300 for 3K!), through an Amstrad CPC464 (neat but boring) to an Atari 520STFM (£399 for 192K Rom and 512K Ram!).

I have suffered, like others, from price falls and wondering if my equipment will perform as intended.

However, a bright light in this hobby of ours is Silica Shop. Directly after Christmas, my wife and I decided that we could afford to buy the fabulous sounding 520STFM, so down to Silica Shop we went.

The very kind staff not only took my wife and me into the back of the shop for a cup of coffee, but also had the honesty to tell us the STFM price was expected to fall in January.

Unfortunately, I was too

impatient to wait, so Silica agreed to discount half what they thought the price would drop by and they also gave us a very generous bundle of items with the ST.

The honesty of the shop is proven by the price falling to their prediction, and of course I have had one month's pleasure with the STFM.

As a final note, on the software front, I know it appears expensive but the quality is unrivalled when compared to 8-bit machines.

Gary T Hill  
Sheffield

## QL Forum

I would be grateful if you could mention in your magazine a kind of magazine on microdrive for the QL. It is called Forum and is available by sending 50p, a stamped addressed envelope and a blank formatted cartridge to Ian Bruntlett at 25 The Broadway, High Barnes, Sunderland SR4 8LP.

Ian Bruntlett

## User group changes

Thanks for printing the last letter concerning the United Amstrad User Group (*Popular*, 30 October). Business has been booming since then. However, I thought I had better inform fellow readers of a few changes.

Firstly the group has had to close its doors to PCW and PC users due to the lack of interest on this side, and secondly we are now offering more services to members. One of these includes a computer book library where members can hire books for a month at a time.

If any Amstrad CPC users are interested in the new 're-formed' user group could they please send me an s.a.e. or stamp at 1 Magnolia Close, Fareham, Hants PO14 1PX, and I will be happy to send them full details of all the services we can offer.

Gary Carter  
United Amstrad User Group

## Calling all Amstrad programmers

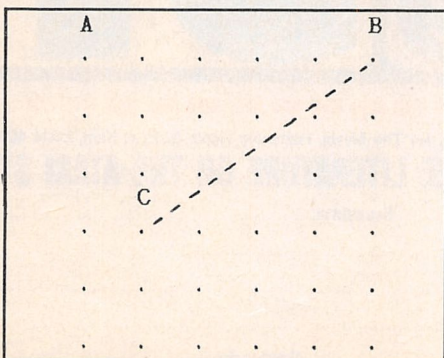
We are a group of amateur programmers who wish to start up a user group of Amstrad programmers, be they beginners or professional authors. The aim of the group is to swap ideas/knowledge in all fields of computing - arcade games, adventure games or utilities. We will do this through a monthly newsletter written by ourselves and fellow Amstraders covering all aspects of computing.

We also wish to start up an Amstrad-specific public do-

# Puzzle

## Puzzle No 244

The diagram below shows a regular grid of dots, each spaced one unit apart, in a six by six arrangement. I can join any dot with any other dot by drawing a straight line in any one of 630 different ways, but if I were to measure these distances I would find that there were only 19 that were actually different from one another. This is because, for example, there are many pairs of dots that are only one unit



apart. Similarly, in the diagram, both A and B, and B and C measure five units.

If the grid were enlarged to 19 dots along each side, how many of the 58,482 ways of pairing two dots would be a different measurement?

## Solution to Puzzle No 239

The only 20 bit number that is itself palindromic, and that has a palindromic equivalent in denary is:

10001110111101110001

This is equal to 585585 in denary.

As the question stated that the end bulbs were lit (ie, represented '1's in binary) the binary number was between 1 (18 zeros) 1 and 1 (18 ones) 1. This represents a denary value of 524289 to 1048575.

The program works by generating an ascending series of palindromic numbers in denary, and then converting these to binary. The denary values are generated from a 'seed' value.

Each seed can form two palindromic numbers, for example, the seed 1234 can generate the two palindromes 12344321 and 1234321. Note that the second of these two numbers is the first number without one of its middle digits.

By commencing the seed at 1 all palindromic numbers are tested, but the initial value can be set higher if desired. Once the two palindromes have been generated (P1 and P2), the denary value is converted to binary in the subroutine.

The conversion is done by a process of repeatedly dividing by 2. Finally the string containing the binary value is tested to determine if it is palindromic. All acceptable values are printed out.

## Winner of Puzzle 239

This week's winner is Andrew Smith, of Gosport, Hants, who will receive £10.

## Rules

The closing date for Puzzle 244 is February 22. Answers should include a program listing if possible.



main user software database. For this we will accept members' own programs of any type. We will copy and distribute the software on tape or disc for a small fee to cover only p./p. and copying costs. If anyone is interested please contact me at 41 Fountains Drive, Acklam, Middlesbrough, Cleveland TS5 7LW.

S T Goodwin  
Middlesbrough

## Yet another Amstrad group

I am trying to set up a users' association for the 8256 and 8512 in the Blackpool and Fylde area and would appreciate it if you could mention this request in your next issue.

I would like to hear from any users in the Blackpool and Fylde area, or anywhere in Lancashire, regarding joining this group. It will have a monthly newsletter as well as discount software, discs and printer paper, and a software library available to members.

If anyone interested writes to me at 435 Lytham Road, Blackpool, Lancs FY4 1JQ, I will send them full details of the group. This also goes for anyone interested in writing for the newsletter.

Andrew Farrell  
Blackpool

## The mysterious panelled bath

With reference to Footnotes in *Popular*, 18 December, would you please give my sincere apologies to Peter Worlock, managing editor of *Popular*, for any inconvenience caused by the words "panelled bath" which appeared on his monitor recently.

Three months ago whilst composing an article for the English Interior Decorators Convention to be held in Stratford upon Avon next March, I became confused whilst re-arranging phrases on my PCW 8512 and inadvertently *Pasted* when I should have *Cut*, and *Cut* when I should have *Copied*.

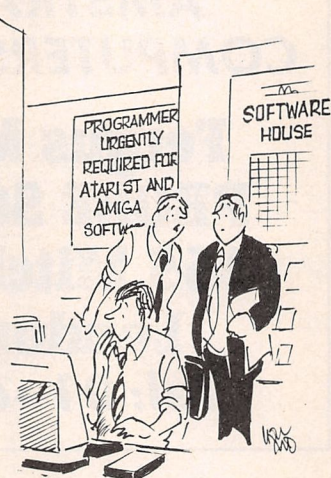
As a result of these errors, the phrase "panelled bath" suddenly disappeared from an important paragraph in which I had been expounding the virtues of the art nouveau

trend in bathroom furniture of the 1930s.

All attempts to regain the missing phrase were without success and the offending paragraph reached the printers minus the vital words.

In consequence, I have been transferred to our West Berlin office where I have been given the task of trying to persuade the authorities to wallpaper the Berlin Wall.

V J Kean  
Berlin



"It's our new programmer. He's going to start when he gets to the end of Starglider"

## Animated arguments

In your Christmas issue (18 December), you reviewed *Animator 1*, *Art Studio* and *Artist 2*. This is the third time you've reviewed our *Animator 1* package and the third time we've been left wondering about *Popular*.

I suppose we should be thankful for the summing up of *Animator 1* being 'impressive', but there's such a major inaccuracy in the middle of the review it at least warranted a letter.

*Animator 1*'s sprite designer capabilities - Chris Jenkins actually said it had been superseded by the small sprite designer you get with *Artist 2*. When you print stuff that's that far out we start to wonder why we bother.

Further, the comments

## Dissent in the ranks

Game Two of the Readers vs *Colossus* tournament is hotting up, with a very varied set of suggestions at move 10.

The Readers, playing white have narrowly gone for moving the queen's bishop out to e3 - see diagram below for details. *Colossus*, playing black, has replied by castling.

### Prizes

A British Museum reproduction Arran chess set will go to the person suggesting the most accepted moves at the end of the game. Five copies of *Colossus Chess 4* (available for most popular micros) will go to the most consistent entrants for the duration of the game.

Next week, we return to *Game One*, where the readers are playing black.

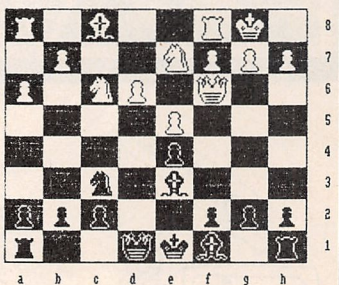
### Use your vote

Now we need your suggestions for the next Readers move. Send your suggested move to either Inter-Mediate (Popular Chess), Freepost, Sawbridgeworth, Herts CM21 9YA (you do not need to use a stamp with this address), or *Popular Chess*, Unit 2, The Maltings, Sawbridgeworth, Herts CM21 0PG (with a stamp). Freepost is slower than normal mail, so if you want to save money on stamps, post your entry promptly. Entries must reach either address by Wednesday, February 11.

The move which gets the most votes will be entered into the game. Results and *Colossus*'s response will be published in two week's time.

### Game two

1	Pe-e4	Pc7-5
2	Ng1-f3	Nb8-c6
3	Pd2-d4	Pc5xd4
4	Nf3cd4	Pe7-e5
5	Nd4-b5	Pa7-a6
6	Nb5-d6+	Bf8xd6
7	Qd1xd6	Qd8-f6
8	Qd6-d1	Ng8-e7
9	Nb1-c3	Pd7-d6
10	Bc1-e3	Ke8-g8 o-o
11	?	



about the technical information manual are both inaccurate and unfair.

This manual is for the infinite customisation of *Animator 1* for different programmers and their techniques. It does not contain sprite driver information. It is sold separately because most users would not require this information and, I'm sure, would not want the extra cost added to the package.

Although your comments on this were totally inaccurate, it also appeared strange that you made a point about sprite information for *Animator 1*, but did not say the same thing for *Artist 2*.

One last point, *Animator 1* is different to *Art Studio* or *Artist 2* in that it completely avoids icons, etc, for the same reason that bicycle manufacturers don't sell bikes with stabilisers welded on. Once you've used *Animator 1* for a while you soon overtake the disadvantages

of the icon environment with its speed and drawability.

Keith Jordan  
Product Manager  
Softcat

(This letter was edited for length.)

Chris Jenkins replies: Having spent many hours using *Animator 1*, as well as *Artist 2*, *Art Studio* and many other art packages, I have a fair claim to be able to judge the merits of various products. Thanks for pointing out that your supplementary programming manual contains no sprite driver information; I'm sure potential purchasers will want to consider this before parting with £5.95.

As for the bicycle analogy, icons may be as unnecessary as stabilisers on a racing bike, but I think you'll agree that your first priority should be to make sure that your tyres are pumped up.



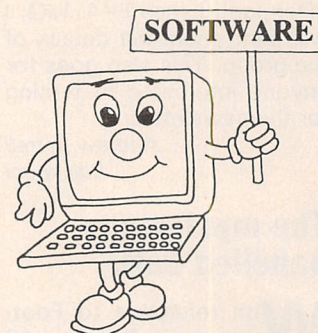
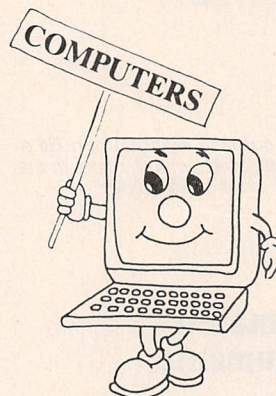
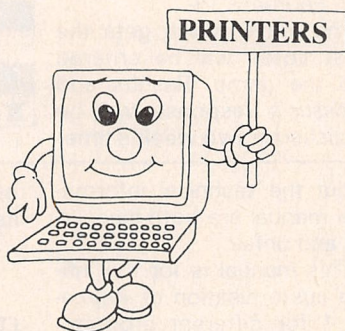
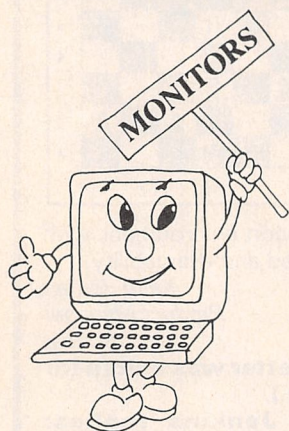
**LESS THAN A  
POUND A GAME**

**COMING SOON**

**FROM  
MICRO/VALUE**

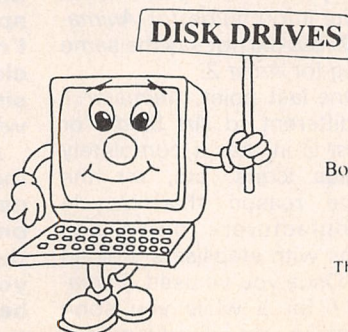
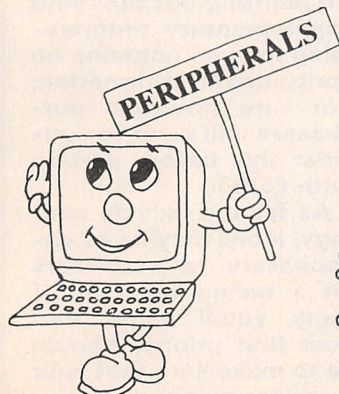
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# Tasword revisited

**T**asword used to be looked on by 'professionals' as a good program to learn on and a good program to leave behind when you moved on to the serious stuff. Nobody would have dared suggest that it could compete in the 'real' world of MSDOS and IBM PCs. However I firmly believe Tasman is going to do splendidly with the new release of *Tasword PC*.

Firstly *Tasword* is known and trusted by thousands of computer users who understand how to use it to the full. It is probably responsible for introducing more people to the benefits of word processing than any other release.

Secondly the company has adhered unshakingly to its policy of value for money – the price is breathtakingly low for a PC release even in these days of Amstrad-inspired cuts.

Most importantly, in their own quiet way, the *Tasword* programs have been gradually improving with every release and are now ready to take on many of the existing IBM releases.

To illustrate the point consider the saga of IBM PCs. Originally when the design was first conceived, 128K was looked on as a lot of memory, and to add more was terrifyingly expensive. Word processors that allowed very long documents,

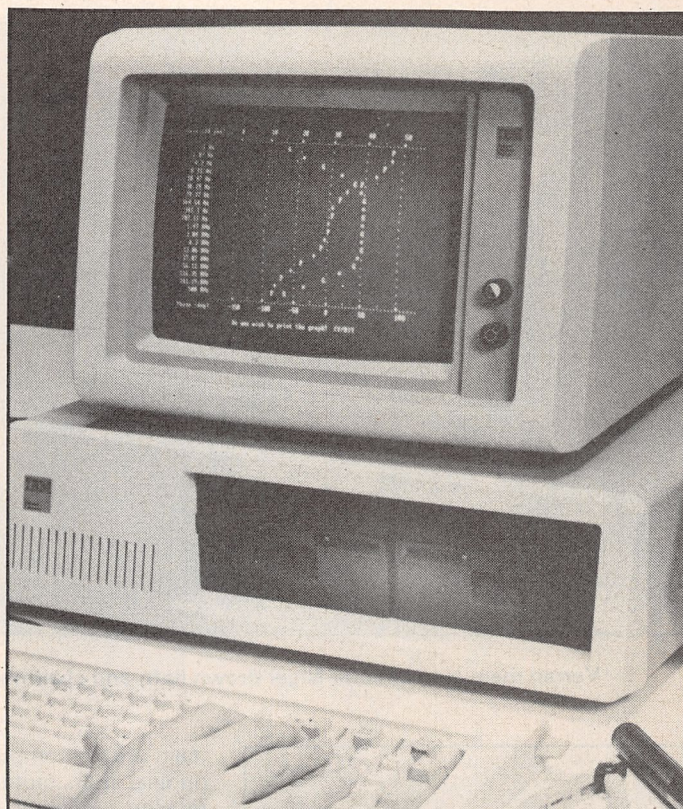
like *Wordstar*, used a system whereby the disc holds the file, with the computer memory looking at sections of this in turn.

The practical maximum length of a text file was one half of the total disc size, leaving the other half for the backup. On the PC this is approximately 180K on a floppy, much larger on a hard disc. The system works but it is slow and cumbersome, and even on a hard disc it becomes unworkable when the file gets above about 400K.

Memory based word processors, ie, that hold the text entirely in Ram, are much faster and easier to use (if you run out of disc room when saving just change to a new blank disc – with *Wordstar* you land in a mess that takes you at least 20 minutes to sort out). These days memory is much cheaper, and almost all PCs have at least 512K, which offers the potential of having files as long or longer than is possible using *Wordstar*.

However, the chip used by the IBM PC tends to divide this memory up into packets of 64K and, as bizarre as this sounds, almost all Ram-based IBM word processors, such as *PC Write* and *PC Outline*, seem restricted to a 64K document size.

Tasman had already cracked the problem of producing long memory files on



Give your PC a hand

the Amstrad PCW, using the Z80 chip that is in theory restricted to 64K memory, so there was no way that they would be baffled by the IBM PC design. You can have as much memory for text as you have available.

*Tasword* is fast, easy to use, has mail merge built in and a variety of support programs such as *Tas-spell* and *Tasprint* for fancy font styles. The *Insert* mode which was weak on early releases is now improved to the point that reformatting is automatic and

instantaneous. There are still one or two weak points – find and replace and block controls are slightly basic – but on the whole this is an invaluable program to have around and at this price no-one should resist it.

**Tony Kendle**

**Program** *Tasword PC Micro* IBM PC Compatible  
**Price** £24.95 **Supplier**  
Tasman Software, Springfield House, Hyde Terrace, Leeds.

## Give your printer more character

**D**espite the fact that the Commodore MPS-801 printer has been superseded by the 802/3 models, it's still used by many Commodore 64/128 owners (myself included).

The main limitation of the machine, apart from the lack of friction speed, has always been in the lack of alternative typefaces. You can produce extended and inverse text, but the standard typeface has no true descenders and you cannot produce italics.

The *Printer IV ROM* has four stored typefaces. Installing it is very simple; just remove the top of the MPS-801, pull out the main PCB, lever the character set ROM out of its socket, then push in the new ROM, which is mounted on a small circuit board.

From the new circuit board leads a short cable terminating in a pair of two-position switches. These can be mounted anywhere you like on the outside of the printer's casing. Reassemble, power up, and you're ready to go.

The first alternative type face is a *Descender* set; in other words, the y, p, j, and so on have proper 'tails' rather than being squashed up to sit on the line. This is an immediate improvement to the

overall appearance of the MPS-801's print, making it much more acceptable for correspondence printing.

For £19.99, the *Printer IV ROM* is the ideal way to improve your MPS-801 without spending around £250 on a new printer. Best of all, there's no threat of software incompatibility or problems printing graphics. Highly recommended.

**Chris Jenkins**

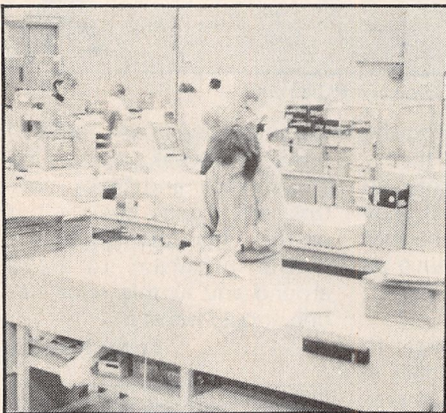
**Product** *Printer IV character set ROM* (compatible with Commodore MPS 801 Printer) **Price** £19.99 **Supplier**  
Datel Electronics, Units 8/9, Fenton Industrial Estate, Dewsbury Road, Fenton, Stoke-on-Trent. Tel: 0782 273815.

## Hardware





Verran managing director Nigel Brown (left) and chairman Ray Johnson



Return to sender – a fully repaired micro is repackaged ready to post back to the customer

**T**he scene is all too familiar: you've just got to the nitty-gritty of your definitive program of subroutines, when the screen seizes up, there's smoke pouring out of the back of the computer, and no amount of key pressing will produce any effect. It's a very dead micro – and you are going to have to run the gauntlet of getting it repaired.

If your computer is still under warranty and thus goes back either to the shop or the manufacturer, the chances are it will end up at Verran. Commodore, Amstrad, Dixons, Currys, Boots and Menzies all regularly send returned micros to Verran for repair.

Founded just three years ago, Verran claims to be "probably the largest repair company in the UK". Lager comparisons aside, it now has 200 people working at its two sites in Frimley, Surrey and a wealth of test equipment, developed by Verran itself, for identifying micro faults.

The micro repair work falls into three

main areas: computers sent in from the original manufacturer, those sent from retailers (generally returned from the customer under guarantee) and those from individuals. Verran also carries out repair work on cordless telephones – notably for Plessey.

With an average of 100,000 micros passing through Verran every month, ensuring that none go astray is a more than full-time job. The company has spent the past 18 months building up a docketing system on its MicroVax computer to provide a system of making sure no-one's micro gets lost or is returned to the wrong person, that is as near error-free as possible.

### Rightful owners

One of Verran's 15,000 square feet buildings act as a depot for all the micros received, and after repair, stores the repacked machines ready for despatch back to the rightful owners.

Each computer is checked in and a full document with the owner's name and address, make of machine, its serial number and any leads or interfaces in-

# When you comput

*Just what happens when y  
away for repair? How do the  
how do they make sure it's  
to you? Christina Erskine w  
Verran in deepest Surrey to*

cluded goes on to one of the MicroVax terminals.

Verran's managing director Nigel Brown says that checking in the computers isn't always so easy. "You wouldn't believe the number we get which have no customer name or address enclosed – or a name and address but no micro in the box they send – or no indication of what they think the fault might be. With missing names and addresses we fill out as much on-screen as we can, and then really, we just have to wait until the customer rings to ask why we haven't returned it yet. Then we can start matching their descriptions to our collection of 'mystery micros'."

After being checked in, the micros move over to Verran's other site (a short walk) for the repair itself.

Most common among the machines received are Spectrums – of every hue and version and dating back to 1982 – Commodore 64s and Amstrad CPCs. Not because these are the computers that most often go wrong, but simply because of the greater proportion sold.

Verran, however, will undertake to try to repair any make of computer and have

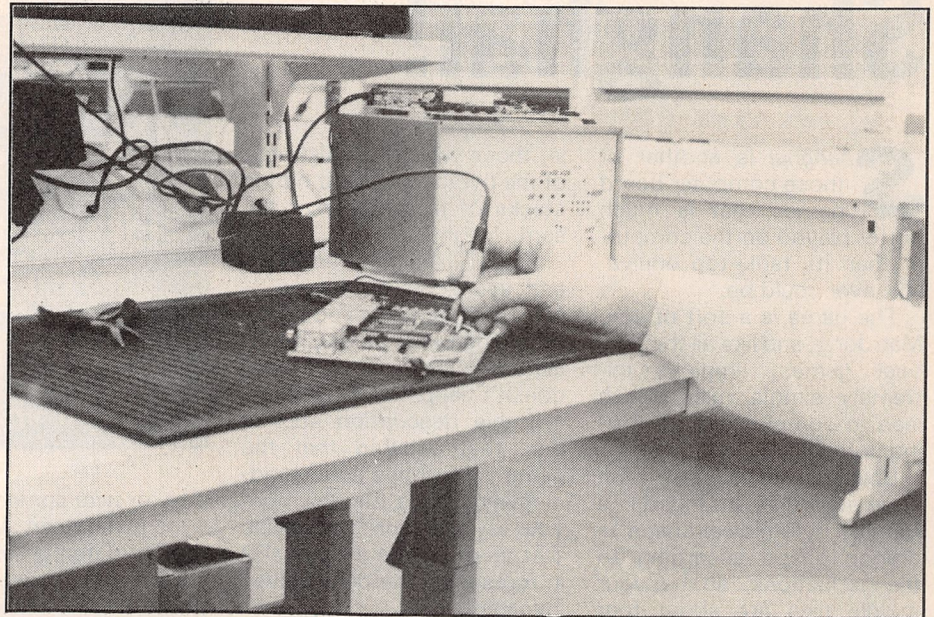


A wealth of test equipment gets to work on faulty Spectrums in the engineering room



## need that ter fix

*You have to send your micro  
they go about mending it, and  
your micro that comes back  
sent down to repair company  
see how it all works*



This Spectrum, attached to Verran's test box, has a fault in the power supply

spare parts for most. "The real problems here are DIY computers. We've had people send us a circuit board and casing with covering letters saying, 'I built this myself, but I can't get it to work; what do you reckon is wrong with it?'" Nigel Brown commented. "It's a bit out of our sphere."

The repair staff work in teams of five: two engineers, two solderers and a tester per team.

First the micro goes to one of the engineers who will link it to one of a number of test boxes (many of which have been designed and built by Verran), which will identify the most common faults. Verran has sold its test boxes to repair companies in Europe, South America and Australia, "but not to any of our competitors in this country," Nigel added. "With the test boxes, 98% of fault diagnosis is now semi-automatic."

"With computers that are out of warranty, it is almost always component failure. Most frequently Ram chips, ULAs, or the processor," said Nigel. "Problems with keyboards probably come next. We get a lot of computers with Coca Cola or orange juice spilled over them. These can make a real mess, so we simply replace the keyboard itself."

The solderers then cut out the faulty chip or part and replace it. The tester then takes over and puts the machine through a fairly rigorous routine to check it is working, using the test box, testing all the keyboard functions and submitting the machine to a soak test – leaving the micro for anything from two to eight hours with the power switched on to check for overheating and the consistency of the power supply.

Commodore machines do not use the test boxes, but are checked with custom

written cartridges, some devised by Verran, some from Commodore itself. The company also uses custom-made devices to test the joystick ports and other interface slots.

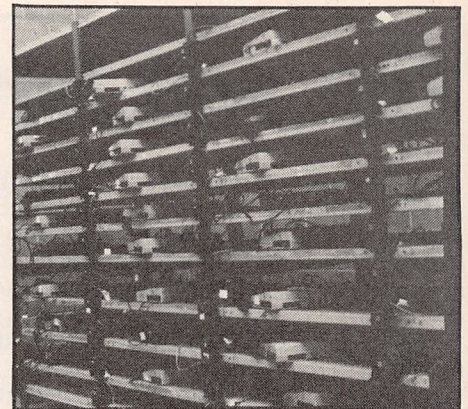
A whole room is devoted to keeping supplies of just the smaller components – mainly i/c chips and clips to the tune of about £500,000 worth. Some foresight is required to keep the right stocks of spare parts. "If a company goes bust, you can run out of parts very quickly," Nigel explained. "We still get a few Jupiter Aces sent in, which are difficult to deal with because the parts are now virtually non-existent."

### Within 14 days

Once the testers are satisfied that the micro has been mended, it goes back to the depot to be repackaged and despatched back to the customer. "We generally aim to return the micro within 14 days," said company chairman Ray Johnson. "Certainly we hope to get the machine back to the retailer within seven, and with some major retailers we now send the computers straight back to the customer."

One area that the company is paying particular attention to is customer services and the MicroVax cataloguing system. Although Verran prides itself that none of its computers go astray, Nigel Brown says there is at least another 18 months work to refine it.

"We are now ready to set up a modem link between the MicroVax records and the customer," he said. "That means that any retailer, manufacturer or individual can dial into the MicroVax and find their own computer's record – when it arrived, what we're doing with it, what the progress has been. That will save a lot of time both for them and us."



Commodore 64s undergo the soak test. Each is linked to a power supply monitor to check its consistency

The majority of Verran's business is simple repair work, but it is sub-contracted by a number of manufacturers to make modifications to computers. Remember the QL Rom updates saga? It was Verran which was unplugging the Eproms and installing JH, AS and the rest of them.

It will also replace English keyboards and Roms with their foreign counterparts for micros being exported.

The company also plans to expand into selling some of its own micro projects, in similar fashion to the test boxes, or on an OEM basis.

As far as possible, Verran will charge, to retailers and individuals, at a fixed rate, rather than going through the business of making an estimate and then charging for each job. Prices range from £19.95 for mending microdrives, or interface ones, to £65 for repairing a PCW8256. Most fall within the £25–£40 range.

Verran, Unit 4, Albany Park, Frimley, Surrey.



# Shanghai!

**S**hanghai is another of those computer board games that is much better played on the computer than its table-top equivalent ever could be.

The game is a sort of solo Mah Jong, and like all the very best games, employs extremely simple rules which lead to complex and absorbing gameplay.

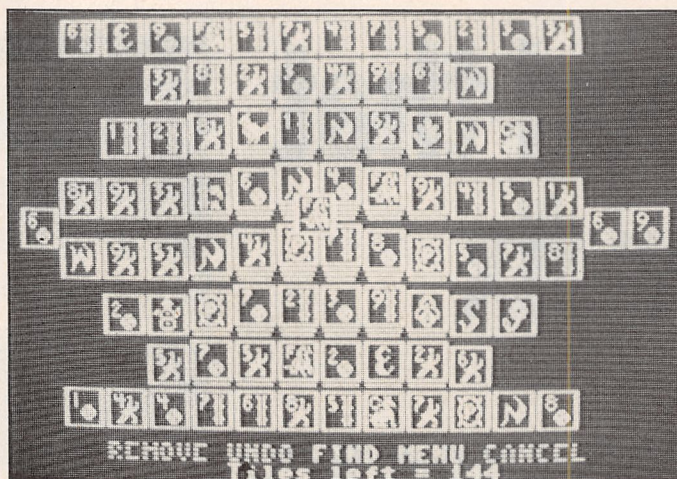
Shanghai uses 144 Mah Jong style tiles, arranged in a roughly pyramidal shape (a dragon shape according to the instructions), so that your middle tiles are about four deep. You must then, using the joystick, remove identical pairs of tiles, which are 'free',

ie, those which can slide out of the pyramid without hitting stacks of tiles higher or the same height.

Get all 144 tiles removed, and you score a 'dragon' — cue neat graphics of fire-breathing beast as a congratulatory screen — but this doesn't happen very often.

If this description sounds dull, rest assured that the game isn't. It has curious addictive qualities, and the more you play, the more you realise that there's quite a bit of skill in foreseeing the best moves involved.

It's also very well programmed with options to play alone or against someone



else, or *with* someone else as a team. You can also peek at the remaining tiles when you've lost to see where all those missed chances were.

One for those who like their brains, rather than their hand-eye coordination, tested.

**Popular Appeal** ♦ ♦ ♦ ♦  
**Christina Erskine**

**Program Shanghai Micro**  
Commodore 64 **Price**  
£9.99 **Supplier** Activation, 23 Pond Street, London NW3.

# Fun and fortune with Brian Clough

**B**oard games which incorporate using a computer have been looked on as somewhat poor relations to the real thing in either field.

This has not deterred CDS, however, from plunging headlong into the clumsily titled *Brian Clough's Football Fortunes*, presumably hoping to repeat the success of its last personality tie-in, *Steve Davis Snooker*.

*BCFF* can really be summed up in a single sentence as *Monopoly* meets *Football Manager*. A multi-player game, you play through a league season as a manager moving your counter around a board and playing either a league or FA Cup game after each round of moves.

The board features Manager's Luck (the equivalent of Chance and Community Chest) a couple of Sunday 'rest day' squares (cf Free Parking) and squares where you must foot the wage bill (its version of street repairs in that the better you are doing, the more you must pay).

There is also Monopoly style money (though inflation has taken its toll and the amounts are rather higher), used to buy and sell players

and pay the wages.

The computer is used to calculate the league tables and fixtures and assesses your rating as a manager in both league and cup and also stocks the Manager's Luck 'cards'.

Then there are the players' cards: 112 current footballers divided between keepers, defenders, the midfield, attackers and 'utility' players and each given ratings from one to five. You can tell Brian Clough himself had little to do with the game design because son Nigel only rates two and Kerry Dixon appears to have somehow bribed CDS into giving him a massive four.

Actually the players' ratings are one of the most interesting parts of the whole product. I mean, would you give Clemence a five, but Southall four in comparison? Only one for John Aldridge? Plenty of scope for lively family debate here.

Anyway, these cards are doled out at the start, so that each person has roughly the same total playing strength, and this forms your team. The results of each fixture you play will depend, *Football Manager*-style, on your rela-

tive strengths in defence, attack and midfield, and the final score is decided by the computer.

So much for the gameplay, but I'm a bit worried that all the game paraphernalia ('banknotes', playing board, players' cards) is rather flimsy and won't stand up to rough treatment. The board splits and folds into six in order to cram it into the video case, the money is plain paper, the footballers' cards are fairly thin. Things could get very fraught if Gary Lineker tears himself in half in mid-season.

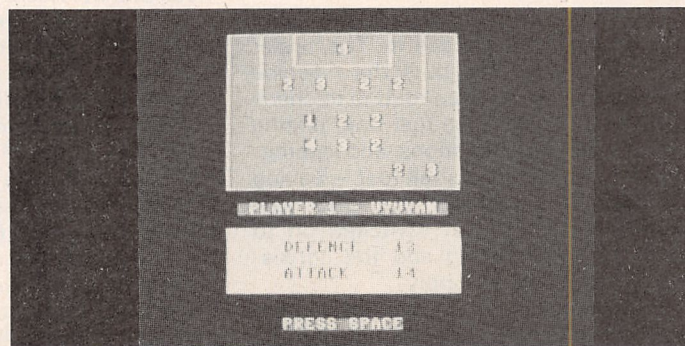
Apart from that, *BCFF* is a nicely implemented, perfectly playable computer board game; the board elements adding a degree of control over your achievements that is perhaps a bit lacking in

*Football Manager*.

Whether it will prove popular or not is a different matter, since it's really for people who a) follow soccer b) like board games, c) have a micro, and d) have like-minded friends to play *BCFF* with. That might narrow the field a bit.

**Popular Appeal** ♦ ♦ ♦ ♦  
**Christina Erskine**

**Program Brian Clough's Football Fortunes Micro**  
Spectrum, Commodore 64, Amstrad CPCs, BBC B and (forthcoming) Amstrad PCW **Price** £14.95 (tape), £17.95 (disc) **Supplier** CDS, CDS House, Beckett Road, Doncaster DN2 4AD.





# Electric dreams

To quote the film adverts, "something wonderful has happened". Indeed, Ocean has produced a film tie-in that both plays well and captures the spirit of the movie.

*Short Circuit*, the movie, is a sort of *ET* clone, the plot being, roughly, that an advanced weapons robot (Number Five) gets hit by lightning and instead of blowing up, comes alive. The technocrats want to dismantle you and security wants to blow you up, which leaves you feeling a

bit like the whale in *Hitchhikers*.

The game plays in two parts – an arcade adventure which has you exploring the research complex in order to find the software and hardware to make your escape (nice game system and lovely graphics) with a second load that has you running away from guards and other robots (stunning them with your laser) while jumping over watery bits and trying not to trample on the local wildlife.

Nothing wildly original, but



the high standard of the implementation and the atmosphere it evokes make this a must for fans of the movie.

**Popular Appeal** ♦ ♦ ♦ ♦

**John Cook**

**Program** *Short Circuit*  
**Micro** Amstrad CPC  
**Price** £8.95 **Supplier**  
Ocean, 6 Central Street,  
Manchester M2 5NS

# Achieving the Impossaball

Games like this tempt the reviewer to indulge in pun-fully bad word play, Hewson bounces back, anyone? It's not even as if it had been away! Neither have ball games, which are currently in vogue.

While some have been a right load of spherical objects, others have been quite pleasing, and this belongs to the latter school. But I still can't help feeling a degree of *deja vu* as I steer the bouncing impossaball through the corridors of doom.

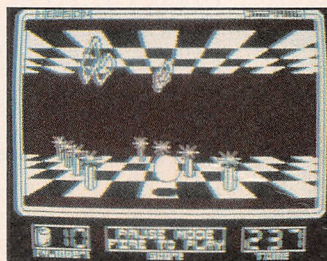
Do you remember *Action Reflex*, for example? That was

virtually the same plot, but with two dimensional graphics. Hewson has added depth, just to make ball control a bit more tricky, and it's a very nice effect too, with a scrolling chequerboard floor and ceiling helping you position yourself accurately.

The aim of the game is to squash drums, all within a time limit. But there are spikes to avoid, columns which give you an uncontrollable boost of speed and wandering electric arcs which fry you in seconds. All very tricky, if not quite impossaball.

While it's undoubtedly a

pleasant diversion, I'm not certain that it has much lasting appeal. Perhaps it's something to do with the barren



landscape; perhaps it's because the cool calculation necessary to bounce in the correct place just isn't enough to get the adrenalin flowing.

It's a solid sort of game but not a thriller. Puzzle solvers could have a field day if they're willing to take their time, but arcade freaks will probably find it too slow and strategists could find it too hard.

**Popular Appeal** ♦ ♦ ♦ ♦

**John Minson**

**Program** *Impossaball* **Micro** Spectrum 48K/Amstrad CPC  
**Price** £8.95 **Supplier** Hewson, Hewson House, 56b Milton Trading Estate, Milton, Abingdon, Oxon OX14 4RX.

# Elementary!

Now – get this for heavy elemental plotting! "In ages past, the Realms of Nature were in Harmony. Unsullied by humankind... this idyllic haven pursued its own course."

You like that sort of thing? Then there's plenty more of it on the inlay card for *Chameleon*, and it certainly helped me change colour – to a sort of billious green – as I realised that though I was reading an undernourished novella, it wasn't really telling me how to play the game.

As far as I can see – but we're in the realms of higher mysticism here – it's all to do

with getting our hero, Chameleon, into the right place, possibly at the right time, to restore a tainted flux to its rightful place in Limbo. Yes, quite!

Quite how you do this is obviously intended to remain a mystery to mere mortals, so there's a lot of experimentation on screen. But the experimentation seems to consist mainly of zapping the elementals that are ganging up on you and jumping across puddles which cause Chameleon to melt despite his wellies. It's not the most exciting process in the world.

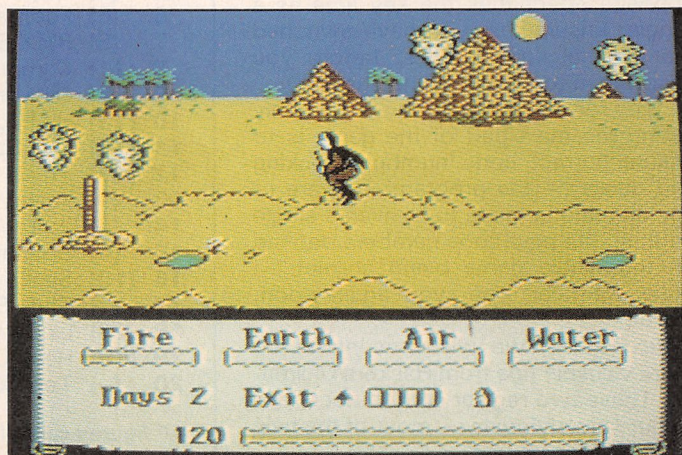
In its favour, Chameleon boasts some nice spot sound

effects, with great rolls of thunder and pops and crackles, suggesting a wild dimension, but in terms of game play, only the most persistent mystic is likely to get much from it.

**Popular Appeal** ♦ ♦

**John Minson**

**Program** *Chameleon* **Micro** Commodore 64/Amstrad CPC/Spectrum  
**Price** £9.99 (tape) £14.99 (disc) **Supplier** Electric Dreams, 31 Carlton Crescent, Southampton SO1 2EW.







# Standing Sentinel

*Tony Kendle passes on more readers tips for Sentinel and Fist II*

**C**ontinuing on from last week, here are some tips for *Fist II*. "Just a short tip, really, to save you from getting beaten up. As you walk along and the screen is scrolling hit *Restore* and the game will pause but you will keep on walking and bypass all enemies. Hit restore again to carry on as usual." Many thanks Chris.

BBC owners have been very active in the column lately, which is good news for other BBC users. That's the way it works – the more stuff you send in for your machine the more you will encourage other people to do the same. (You know it makes sense.)

The latest letter comes from Martin Crawford of Whitehills who writes "the enclosed program allows the sentinel to be switched on and off in Firebird's Ebonymons game. (BBC version). I have found this very useful, especially on sheets containing several sentries since the latter are disabled as well as the sentinel.

"The program should be typed in and saved *before* running – just in case! Once run the machine code checks for the @ key being pressed. The program restarts itself after a break so *Shift/Break* does not disable it. I have only tried this program on the disc version of *Sentinel*, but it should work on the tape version if the assembly address in line 70 is changed to &370.

"Load the *Sentinel* game but do not press the @ key until you are into the main part of the game i.e. after the map has been displayed. Pressing the @ key will produce a short beep after which all sentinels/sentries will be disabled – pressing the key again will have the opposite effect thus the key acts as a toggle. Ensure that you have switched the sentinel *on* again just before you absorb him to complete the sheet.

"The reason for using the toggle only during the main part of the game is to ensure correct code number checking and display – the program is aware of any alterations made to it, even a single byte, so the new code numbers depend on the whole game being correct." I hope we hear from you again soon, Martin.

Next week, we will concentrate on more valuable tips from Hackers Unlimited. These two regular contributors have all but solved *Equinox* – most of the help is in the form of tips.

```

10 REM SENTINEL rotation ON/OFF
20 REM using @ key - for BBC B.
30 REM
40 REM By Martin Crawford.
50 REM
60 FOR pass=0 TO 2 STEP 2
70 PX=&380
80 [OPT pass
90 .start
100 LDA &FC:PHA \ save accumulator
110 TYA:PHA:TXA:PHA \ save X and Y
120 JSR key
130 BNE exit
140 .loop
150 JSR key
160 BEQ loop \ is "e" still pressed ?
170 LDA &16A8
180 CMP #&60
190 BNE bypass \ is RTS/TSX current ?
200 LDA #&BA \ TSX instruction
210 STA &16A8
220 JMP beep
230 .bypass
240 LDA #&60 \ RTS instruction
250 STA &16A8
260 .beep

270 LDA #&07:JSR &FFEE \ write BELL
280 .exit
290 PLA:TAX:PLA:TAY \ restore X and Y
300 PLA:STA &FC \ restore accumulator
310 JMP &DC93 \ original vector
320 \ keyboard scan for "@" key
330 .key
340 LDA #&79:LDX #&C7:JSR &FFF4
350 CPX #&C7
360 RTS
370 .setup
380 \ setup primary interrupt vector
390 SEI
400 LDA #(start MOD 256):STA &204
410 LDA #(start DIV 256):STA &205
420 CLI
430 \ set for BREAK to enable routine
440 LDA #&4C:STA &287
450 BNE skipbyte
460 NOP \ BREAK corrupts this byte
470 .skipbyte
480 LDA #(setup MOD 256):STA &288
490 LDA #(setup DIV 256):STA &289
500 RTS
510 ]:NEXT
520 CALL .setup
    
```

## Charts

### Top Twenty

- 1 (1) Gauntlet
- 2 (3) 180
- 3 (2) Paperboy
- 4 (4) Konami's Coin-op Hits
- 5 (8) Ninja
- 6 (6) Footballer of the Year
- 7 (5) BMX Simulator
- 8 (11) Computer Hits Vol 3
- 9 (9) Ollie and Lisa
- 10 (13) Hit Pack
- 11 (14) Five Star Games
- 12 (7) Trivial Pursuit
- 13 (-) Agent X
- 14 (-) Jailbreak
- 15 (-) Scooby Doo
- 16 (10) Space Harrier
- 17 (-) They Sold a Million (3)
- 18 (16) La Swat
- 19 (18) Head Coach
- 20 (-) Top Gun

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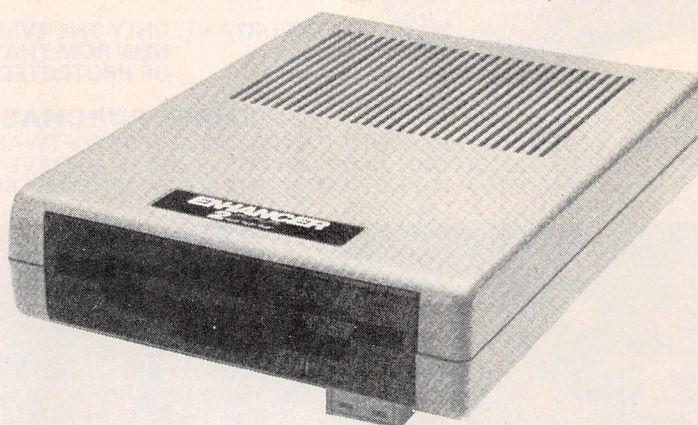
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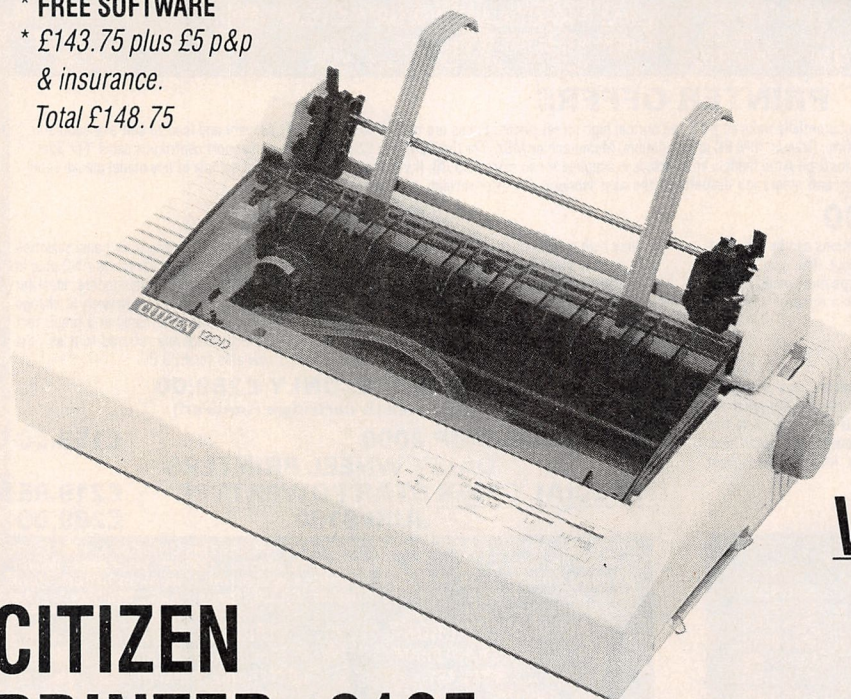
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## Scouting out the talent

*Tony Bridge reports on an adventurous group of Scouts and the game they have devised.*

Over the years, I've been kept informed of the efforts of the Duncan Bowen Youth Wing down in Ashford in Kent. The programs that I have seen from the Youth Club source are developed by the kids themselves, and are always very interesting and, more surprisingly, educational in a real way.

Using *The Quill* to great effect, Jim Fanning, the course tutor, and his pupils have created some excellent programs, most of which draw on local history. While this would seem to limit the appeal to inhabitants of Kent, in fact the programs are universally interesting, if only because they show what can be done with *The Quill*.

Mr Fanning has sent me three packages recently, the first of which is *A Scout Challenge*. This disc for the Commodore contains a suite of four programs designed to increase your knowledge of the scouting movement(!).

At £3.50 (for the Commodore only), the four programs are great value.

Of more interest, perhaps, to the

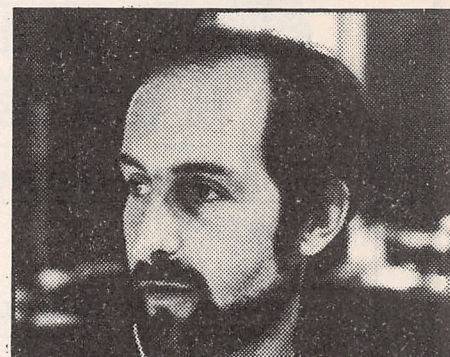
classroom and others, are the other two programs, *The Search*, set in an imaginary Kentish village, and (to get away from Kent) *A Glasgow Murder*.

The first of these takes place in the fictitious village of Bidden; the family of Griggs is the oldest in the village, and it is up to you to find out, with the aid of the program, as much as you can about the family. As well as the *Quill'd* adventure you have a pack of documents such as school books, maps, newspapers and so on, ranging across the ages from 1592 to present time.

The puzzles are not too obscure, as befits a program that is meant to be of some use to a class.

Using the command *Database*, you can access a screenful of subjects on which to quiz the computer. These include war (the Griggs family were involved in the Falklands/Malvinas conflict), photographs, maps, local history (each of which gives advice to pupils in following up each subject to provide more information), churches and so on.

*A Murder in Glasgow* comes in a similar



pack, although the database is not available here. Players are encouraged to explore the adventure and then answer a series of questions about the case, which is based on a real-life murder enquiry of the mid 1970's. The player can visit the scene of the crime and uncover important clues and interrogate important witnesses and suspects. Finally, your suspicions may be passed on to the chief police officer covering the crime.

As with *The Search*, full information is provided for pupils and teacher, for educational purposes, and the adventure is available for the Spectrum (tape, disc or Microdrive), the Commodore 64 (tape and disc) and BBC/Electron (tape only).

Because the programs are unprotected, the *Quill* databases are easily altered, if desired, to reflect and promote interest in local affairs. "The beauty of a *Quill* database," says Jim Fanning, "is that it can be so easily adapted and altered."

*J Fanning, Duncan Bowen Youth Wing, Kingsnorth Road, Ashford, Kent TN23 2LY (Ashford 29804).*

## Games: Adventure Helpline

The New Year has brought a few changes to the set-up down at Delta 4, with the emergence of a new company called Abstract Concepts. Supremo Fergus McNeil will be revealing all soon, but at the moment is admitting nothing except the fact, "I work for both!" Abstract will be concentrating on the more serious style of adventure, while Delta 4 continue to produce the spoofs we've come to know and love.

CRL have just released an adventure part programmed and designed by Fergus, *Murder of Miami* - very much a classic Agatha Christie style mystery. The next Delta 4 production, however, is a spoof detective romp, set in the Sam Spade/Mike Hammer era, to be published by Piranha. Afficianados will be pleased to learn that Skeptical 3 will be on the B side. Can't wait.

**John Cook**

**Aftershock on Spectrum.** I have completed 44%, explored the city zoo (I can't get the elephant to do anything except kill me!), sewers, underground stations all the way to the filling station. I can get no further. I've been over it three times - what have I missed? Dan A Townsend, 9002 Winding Way, Germantown, TN 38138-6625, USA.

**The Pawn on Atari ST.** What does the guru want? Where's the key to the tree? P Wilson, 61 St Swithin's Walk, Acomb, York.

**Heroes of Karn on Amstrad.** Where do you find the falcon and how do you get to it? Desmond Hart, 12 Manesfield Road, Port Ellen, Islay.

**The Colour of Magic on C64.** How do you get past the troll in part two? T N Branston, Hollies Farm, The Posts, Cropwell Butler, Notts NG12 3AS.

**Planetfall on Amstrad CPC6128.** How do I get Floyd the robot to give me his elevator card? Ms Adrienne Briggs, Flat 1, 24 The Avenue, W Ealing, London W13 8LP.

**Heavy on the Magick on Amstrad.** How do I open the locked door? Derek Wong, 42 Ingram Road, Thornton Heath, Surrey CR4 8EB.

**Smugglers Cove on Amstrad CPC464.** Stuck in Palatian Room and need exact words to get on to pentacle. What do you do with the acid, hungry cat and pirate? Have completed and can offer help on *Red Moon*, *Jewels of Babylon*, *Heroes of Karn*, *Message from Andromeda*, *Seabase Delta*, *Forest at World's End* and *Warlord*. Limited help on *Mordon's Quest* and *Smugglers Cove*. Christopher Eng, 14 Amner Road, London SW11 6AA.



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**Y**our're struggling to get to grips with computing, baffled by the jargon and technology, filled with wonder at the capabilities of your amazing 16K mega-machine. An odd time, then, to ponder the future of personal computing.

But even in the first flush of enthusiasm, there'll be times when software that works at a snail's pace drives you to distraction. Or you'll be shuffling through a box of 30 unlabelled discs looking for a specific program and cursing so-called state-of-the-art storage.

At times like this, the words on your lips will be "I wish..." and "If only...". This article looks ahead and rates the chances of your wishes coming true.

## Computers

To begin with the obvious, computers will continue to become more powerful and, simultaneously, less expensive. Just over a year ago, the technology represented by the Amiga and the ST appeared to be beyond the reach of the majority of home computer users. Now, the ST is down below £300, while Commodore appears to be on the brink of introducing a similarly-priced Amiga.

What makes these machines so exciting is their graphics abilities, powerful sound, and large memories. Just the job for computers as entertainment.

In the more staid area of business, the epitome of power was represented by the IBM PC and its compatibles – but that power carried a price tag in the region of £2,000 and up. Now – thanks to Amstrad and others – that technology is yours for £500.

Already in position are the next generation of computers. In business, there are machines like the Compaq 386 running Intel's incredibly powerful 80386 processor. On the other branch of the tree, Motorola's comparable 68020 processor is poised to take the world by storm in the successors to Apple's Macintosh, and the ST and Amiga.

These processors bring more raw power to computing – they can handle more information more rapidly. But they are bringing with them an army of support chips. For example, maths co-processors

which can crunch numbers with lightning speed and very high precision. Or graphics chips which offer similar power in creating screen displays.

Graphics power will also continue to develop in its own right. We have quickly gone from so-called high resolution colour graphics (320×200 pixels, 16 colours) to machines like the ST and Amiga which allow you to mix vast colour ranges from a palette of thousands. But there are machines on the horizon which will offer screen resolutions of up to 1200×800 pixels.

## Storage

As fast as the development in computers has been, it has been matched, if not exceeded, by the development of storage systems.

At the beginning of the 1980s, floppy disc systems could cost up to £1,000 for less than half a megabyte (512K) of storage capacity. These floppy discs are easily damaged, and require very careful handling.

Now, we have 3.5in hard-cased floppies offering up to 800K of storage on a single disc, and the drives are down to around £200. It seems likely that the day of the 1Mb/£100 disc system is not far away. These discs have the added advantage of being much more robust – you can carry

one around in a pocket, drop it on the floor, even throw it across a room (not recommended) and it will probably carry on working regardless.

At the same time, an even better form of storage has been making great strides – hard disc systems. Hard discs do not flop, which means that they can be spun at vastly higher speeds, and this, in turn, means they can hold far more information.

A few years ago, a 5Mb hard disc could cost up to £2,000. After a while the same price could buy you 10Mb. Then 20Mb. Now 20Mb systems costing under £1,500 are common, and 10Mb discs are down to as little as £500.

How long before we have a 40Mb hard disc at the price of today's 400K floppy system?

As if this is not enough to boggle the mind, thundering up on the rails is a completely new form of storage – laser discs.

This is a variant of the same technology used in laser video and compact disc audio systems. Laser technology introduces some interesting sides to the storage argument. For one thing, because the laser is so precise in reading back information, vast amounts of data can be stored on a compact disc – so much so that a new term has entered the everyday

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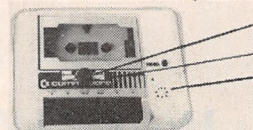
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vocabulary of computing: gigabyte. A gigabyte is 1,024 megabytes or 1,048,576 kilobytes. Laser systems offering 4 gigabytes capacity are now the standard.

Another aspect of the new technology is the problem of building a laser system that can write to the discs. Because of this, most systems are read-only, hence the name Compact Disc - Read-Only Memory, or CD-ROM.

However, some manufacturers have created systems which allow the computer to write once to the disc, but once the data is written it can't be erased. These systems are known as WORMs - Write Once, Read Many.

The idea is that every time a new version of a file is saved to the disc, it is written in a new place. Although this seems wasteful, you have to remember that each laser disc can store the equivalent of a couple of thousand floppy discs, so the costs are negligible in comparison.

But more than the simple numbers, impressive though they are, laser storage offers new possibilities for computer use. The most commonly quoted example is the encyclopaedia on a disc, with the speed and ease of use of computerised filing and cross-indexing. Imagine, any entry in the *Encyclopaedia Britannica* at your fingertips in seconds.

Other new applications include a system called Hypertext, which is an information system using words and pictures. Using an on-screen pointer, you select a phrase or picture. The computer then displays a further screen of more detailed information on your chosen subject. On this new screen you select a new item, and a further screen of information appears. And so it goes through subsequent levels.

On the entertainment side, laser storage opens up the possibility of true interactive video. The standard so far, where the technology has been used in arcade games, has been very crude, but it can't help but improve as the systems become more sophisticated and programmers learn to make the most of them.

## Printers

The main developments in print technology are in marketing - ie, price and features. Very little in the way of new technology has been introduced.

However, the developments are not to be sneezed at. We now have fast, reliable, medium-quality printers available for a little over £100, and very high quality printers for well under £500. These prices represent falls of 60 to 70 per cent.

The most exciting moves are taking place at the top end of the market where

laser technology is also making an impact. Laser printers have the power to produce near-typeset quality output (ie, close to the quality of magazine and newspaper print) and prices have fallen from around £3,000 to just over £1,000.

Unfortunately, there are unlikely to be any major reductions for some time, and the £500 laser printer is a long way off.

## Communications

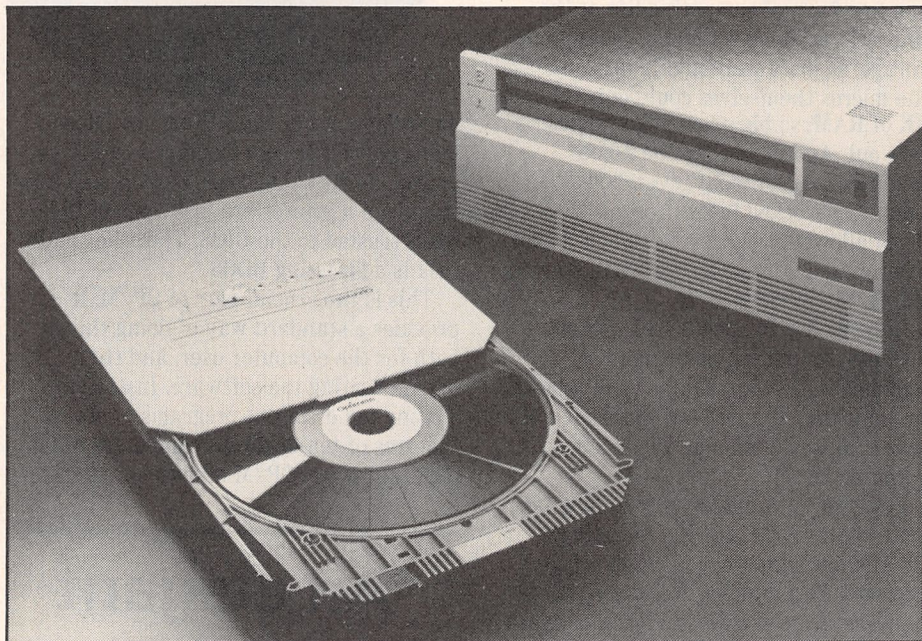
This is one of the most disappointing areas in current computer use. Although

## Brave New World

So what does it all mean? Some of the developments mentioned above, although technologically feasible now, will take a while to become commercially viable (ie, cheap). Others are very close to becoming standard features.

Putting them together, we can come up with the kind of system that any manufacturer could (repeat: could) launch by the end of 1987.

A true 32-bit processor (as opposed to the cut-down 32 bits currently available in



Laser storage: this model from Optimum stores 1 gigabyte of information on a 12-inch laser disc

progress has been made, the potential remains enormous.

The problem is simply that there aren't enough people supporting computer communications, and until there are, the services available will find it difficult to develop, but until they develop few people will get into comms. Classic catch 22.

However, a look at the situation in America gives you some idea of what is possible. Indeed, it's easy to come away from the US with the impression that everyone is permanently on-line to everyone else.

Commercial services like *The Source* and *Compulink* have as much information and entertainment as a night with the TV, several magazines, and a week's trips to the pub combined. It's not so much that there are unusual or innovative ideas at play in the US, as the scale to which they've been developed.

The biggest single impetus to increased comms use in the UK would be a special price rate for computer use of the telephone system, but it would be difficult to administer and there are no indications of any such move happening soon.

the ST and Amiga). This will preferably be a Motorola 68020, with dedicated graphics chips offering on-screen resolution of around 1000x400 pixels in monochrome, or 600x300 multi-colour, and hardware-driven graphics manipulation and animation.

Free memory could be anywhere between 2 and 4Mb, with a minimum of 1Mb of floppy-disc storage and preferably a 5-10Mb hard disc.

Starting price for such a system could be under £1,500 including high-resolution colour monitor. The catch, of course, is that there'd be no software to take advantage of all this power, so you'd be better off buying a 1Mb ST which could be down to under £500 by Christmas this year.

The moral of the story is quite clear: looking to the future is fun and can be a worthwhile exercise, but is ultimately pointless. The only thing that can be said with certainty is what was said at the start: computers get more powerful and cheaper but you may as well buy one now. Waiting for the perfect machine is an infinite process.



**T**here was this bloke called Gary Kildall, see. Back in 1974 he was doing some work on Intel's hot new chip, the 8080, and decided he wanted an operating system. Things being what they were then, he wrote it himself.

Just at the right time cheap floppy discs arrived, and young Gary decided he'd make this new operating system of his work with these new-fangled storage systems.

From such humble beginnings was CP/M born.

The reasons for CP/M's success hinge on a few facts of computing life at the time. Microcomputers had relied on tape storage, so discs were highly desirable. The micros themselves could only address 64K of RAM, so big operating systems were out. And much like the home computer market today, everybody's computers worked in a different way – but CP/M allowed programs to run on lots of different machines. Once the ball started rolling, CP/M cleaned up.

But CP/M was always tied to 8-bit business computers, and when IBM launched its 16-bit machine (and hijacked the industry), it opted for Microsoft's MS-DOS. It looked as though CP/M's days were numbered.

However . . . tons of software had been written for CP/M, and if you could get CP/M on your micro, you could get the software. So a number of home computer manufacturers – notably Amstrad, Acorn and Commodore – and several makers of add-on products started supporting CP/M and the old stager made a comeback. (It is a source of endless debate to speculate how different would Sinclair's fortunes have been if Sir Clive had put CP/M on the Spectrum.)

Regardless of CP/M's good fortune at being the right product at the right time, had it not been as good as it was, nothing could have lifted it to its runaway success.

Of course, it looks crude by today's standards. Yes, it can be downright irritating. Sure, those cryptic error messages can get right up a person's nose. But it's a solid product, it doesn't foul up on the job, it doesn't take much memory, and it lets you run bundles of software.

Perhaps the main reason for its success is that it is a very elegant solution to a difficult problem.

## BDOS and BIOS

These two components are the heart of CP/M. BDOS is the Basic Disc Operating System, and takes care of all the chores related to disc storage – reading and writing files, and keeping track of what's where on the disc.

BIOS is the Basic Input/Output System,

# CP

and takes care of everything else. How many characters are displayed on the screen, how the keyboard is read, and how to control a printer are just some of the tasks trusted to the BIOS. The other main task is addressing BDOS.

This is the crucial part of CP/M: it provides a standard way of doing things, both for the computer user, and the person writing the software. Instead of writing ten different programs to access features of ten different computers in ten different ways, CP/M allows you to write

you want to display a character on screen you don't have to worry about how this particular computer does it. Just tell CP/M what you want and let the operating system manage the details.

This makes it very easy to write a CP/M program since it consists largely of standard calls to the standard CP/M routines.

## Transient commands

The second elegant hallmark of CP/M is its use of what are called transient commands. Think about it: if you only have 64K to play with, you don't want to fill it up with operating system commands which leave you no room to do any work.

CP/M gets round this problem by including only the bare essentials such as the ability to read a disc directory, load a program file, erase a file, and so on.

It is that ability to load and execute a program file that gets round the problem. If you want to copy a program, CP/M loads in a copy utility, does the copying, then "forgets" the utility, leaving the space free for whatever else you want to do.

These little utility programs are called transient commands. Many of these commands can perform a variety of tasks, depending on the form of command used. For this reason, it is not possible to go into the commands in detail here. What follows is a very brief description of the most common commands – you should refer to your manuals for full details, or for information regarding the CP/M programming utilities.

## DIR

The foremost memory-resident command, it simply displays a directory of all files on disc.

## DIR.COM

A transient command, DIR.COM is a more

## 'An elegant solution to a difficult problem'

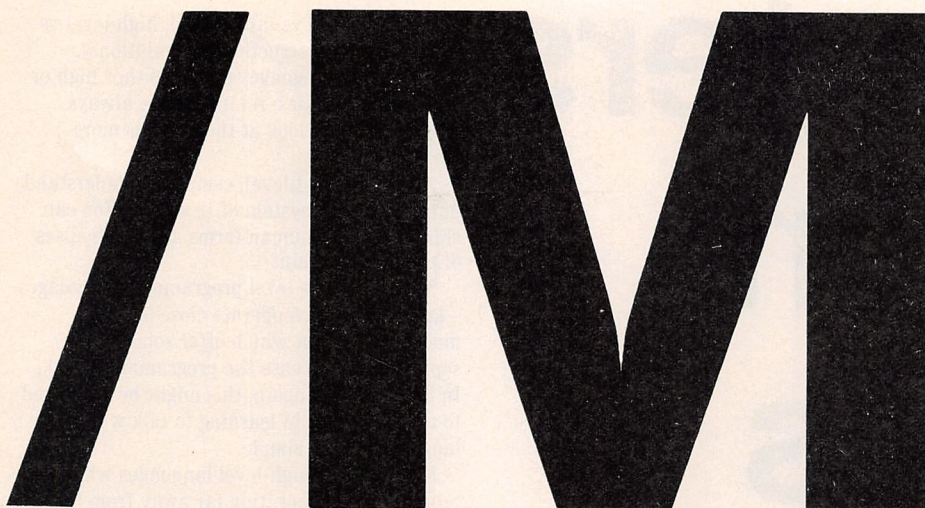
on program. That program will run on any CP/M computer.

When a computer manufacturer buys CP/M for a machine, it comes in the two parts – BDOS and BIOS. BDOS is sacrosanct, never to be touched. BIOS, however, is a partially filled table of commands which the manufacturer completes with the details for his own machine.

You can think of CP/M like a restaurant waiter, and the programmer like a customer. Instead of having to go to the chef and order a main dish, then to the vegetable cook to order veg, then to the wine waiter to order a drink, the customer deals with the waiter. The waiter takes care of the details.

So the programmer deals with CP/M. If





powerful version of the built-in DIR function. It not only displays the names of the files present, but also the length of those files and other information.

## DIRSYS

Similar to DIR, except that it is a transient command, and displays directory information about the CP/M system files only.

## ED

Like SUBMIT, ED is not so much a command as a utility program. It is actually a very crude text editor, and while you could conceivably use it to write a letter, you'd have to be desperate to do so.

ED's most common function is as a means of writing SUBMIT files, or - more powerfully - source code files for machine-code programs written in Z80 assembler language.

## ERA

The second memory-resident command, ERA allows you to erase files on disc.

## PIP

PIP, a transient command, is most often used for copying CP/M files between discs, or creating duplicate files on the same disc. However, it can also be used to redirect output between screen, disc and printer.

The syntax of the command varies according to what you're trying to achieve, but the most important thing to remember is that PIP requires you to specify destination first, origin second. CP/M does not work in the usual fashion of FROM A TO B. Instead it requires TO B FROM A.

## REN

This command is memory-resident and allows you to rename files on disc. As with

PIP, the correct order for filenames is TO NEW FROM OLD.

## SET

Allows you to configure discs and drives to your own preference. For example, you can make some files read only, or an entire disc read only, or even a drive read only such that you could never write to a disc in that drive. Obviously, SET allows you to reverse these decisions.

## SETDEF

Allows you to configure your computer to handle discs in different ways. For example, in a twin-disc system you may want the computer to search both discs for a file, or - if you regularly use one disc for applications and one for data - you could have it look to only one of the two discs, or one first then the other.

## SETKEYS

Executes a key definition file through which you can configure individual keys or combinations like shift-key or CTRL-key, to produce either different characters or control commands such as cursor up, or delete.

## SETSIO

Useful for comms freaks only, SETSIO allows you to change the attributes of the serial input/output port on your computer. Possibilities include changing transmission speeds and protocols.

## SHOW

A simple adjunct to the DIR commands, SHOW tells you whether a drive is read only, or read-write, and how much space is available.

## SUBMIT

Not so much a command as a small utility program, SUBMIT's function is to execute a series of commands contained in a .SUB file. This is a way of creating small strings of commands and having them execute automatically. Possible purposes might include copying files between discs, deleting temporary work files, and doing general housekeeping at the end of a working session.

## TYPE

This transient command gives a quick and easy way of discovering the contents of a file without having to load the application program which created it.

The only other thing you need to know at this stage is that the UK CP/M Users' Group is at 72 Mill Road, Hawley, Dartford, Kent.

Directory For Drive A: User 0										
Name		Bytes	Recs	Attributes		Name		Bytes	Recs	Attributes
BASIC	COM	28k	224	Dir	RW	DIR	COM	15k	114	Dir RW
DISCKIT	COM	7k	56	Dir	RW	ED	COM	10k	73	Dir RW
ERASE	COM	4k	29	Dir	RW	J14CPM3	EMS	40k	320	Dir RW
KEYS	WP	1k	7	Dir	RW	LANGUAGE	COM	1k	8	Dir RW
PALETTE	COM	1k	8	Dir	RW	PAPER	COM	2k	16	Dir RW
PIP	COM	9k	68	Dir	RW	PROFILE	ENG	1k	2	Dir RW
RENAME	COM	3k	23	Dir	RW	RPED	BAS	7k	55	Dir RW
RPED	SUB	1k	1	Dir	RW	SET	COM	11k	81	Dir RW
SET24X80	COM	1k	8	Dir	RW	SETDEF	COM	4k	32	Dir RW
SETKEYS	COM	2k	16	Dir	RW	SETLST	COM	2k	16	Dir RW
SETSIO	COM	2k	16	Dir	RW	SHOW	COM	9k	66	Dir RW
SUBMIT	COM	6k	42	Dir	RW	TYPE	COM	3k	24	Dir RW
Total Bytes = 170k Total Records = 1305 Files Found = 24										
Total 1k Blocks = 170 Used/Max Dir Entries For Drive A: 27/ 64										
A>dir										
A:	J14CPM3	EMS	:	PROFILE	ENG	:	RPED	BAS	:	RPED
A:	DIR	COM	:	DISCKIT	COM	:	ED	COM	:	ERASE
A:	PALETTE	COM	:	PAPER	COM	:	PIP	COM	:	RENAME
A:	SET24X80	COM	:	SETDEF	COM	:	SETKEYS	COM	:	SETLST
A:	SHOW	COM	:	SUBMIT	COM	:	TYPE	COM	:	KEYS
A>										
A>										
A>										
A>										

The different results of DIR.COM (top) and the built-in DIR.



# Computers speak in tongues

If you've followed our introduction to Basic programming in the last three issues, your appetite for programming should have been sharpened. As we pointed out, Basic has a number of advantages – ease of learning, ease of use – against which must be set two significant disadvantages – lack of speed, and the fact that the Basic language itself must be present in the machine for programs to run.

Basic has other minor disadvantages too. For example, it was not designed to handle graphics (it dates from before the time when graphics became commonly available on microcomputers). Also, every manufacturer uses a slightly different form of Basic on different machines so it is more or less difficult to transfer programs.

Finally, learning another language can be worthwhile in itself. It can be fun, and you can gain new insights into computers and software.

Hopefully, you are now prepared to look for alternatives to Basic. Your last objection might run like this: Why learn another language before I've got to grips with the Basic that comes with my machine? The answer is simply

that once you get stuck into one version of Basic, making the switch can be difficult. You'll find it easier to learn a new language before you get trapped by familiarity.

The next question is which of the many possible languages should you choose. The answer will depend on the kind of applications you want to run on your machine.

All languages are designed with different aims in mind. Basic was designed to be a teaching tool; it was never intended that you should use it to write working programs. Forth was originally written to control machinery from a computer – specifically a telescope. The history of Pascal is a little like that of Basic: it was designed to teach programming, though Pascal is much more rigid in its approach. BCPL and its derivative, C, are excellent tools for system programming – writing operating systems or other languages.

Languages are also related. BCPL and C, for example, while Modula-2 is derived from Pascal, and Logo and Lisp have a lot in common.

We can consider languages in three groups

of two: compiled vs interpreted, high-level vs low-level, and instructional vs relational. Instructional languages may be either high or low-level languages; relational are always high-level. Let's look at these terms more closely.

At their lowest-level, computers understand only the binary system of 1s and 0s. You can think of this in human terms as the synapses of the human brain.

Next come low-level programming languages – languages which operate close to the machine level but which offer some sophistication to ease the programmer's task. In human terms again, this might be compared to the first steps in learning to talk where our language is very simple.

Finally come high-level languages where the programmer is operating far away from the machine level. You can issue single commands to perform quite complex actions, and the language itself contains the necessary sub-steps required to complete the action. These programming languages can be compared to high-level human languages – not only English, French, etc, but the symbolic languages of maths and physics where extremely complex ideas can be expressed in a few symbols.

Instructional languages are the most common variants. Basic is one. The characteristic of an instructional language is that the program comprises a large number of instructions: get two numbers from the user, add them together, print the result, and so on. Other instructional languages include Forth, Pascal, Fortran, C and machine language itself.

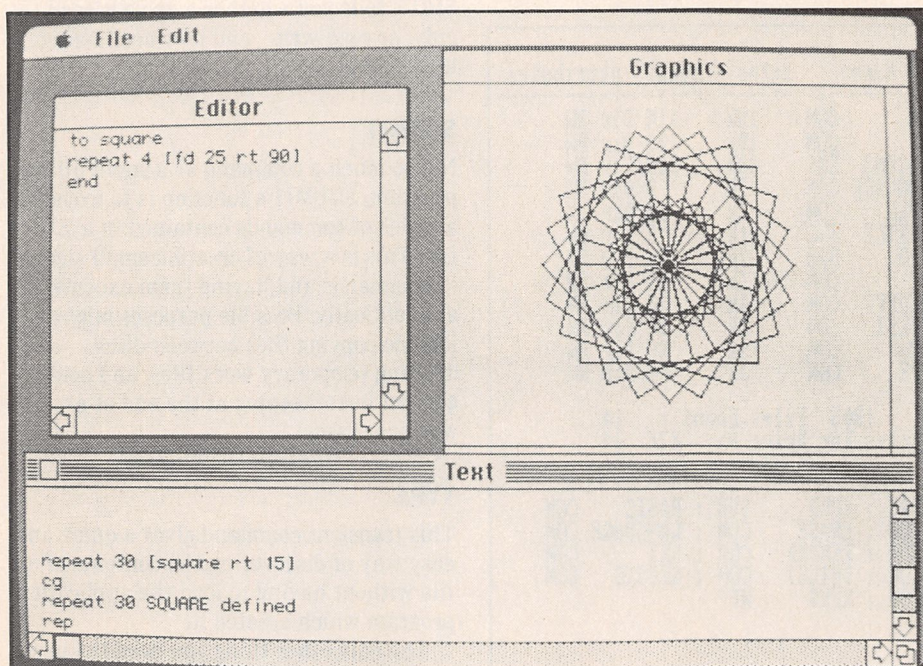
Relational languages operate in a very different manner. The program is mostly data – raw information – with each piece of data defined by its relationship to other data. The other main part of the program is a set of rules... the ways in which the different types of data can be matched against each other. Prolog and Lisp are two prime examples of relational languages.

If you have spent any time programming in an instructional language like Basic, relational languages can be hard to grasp. But they are the next generation of computer languages, aimed at creating programs which learn, and which can manipulate concepts as well as numbers. These languages are in the forefront of research into artificial intelligence.

The difference between interpreted and compiled languages is one of the most crucial. It affects the speed at which programs execute, and the ease with which they can be written.

When a computer runs an interpreted language, it is a small master program – the interpreter itself – which actually does the work. The interpreter takes your program one line at a time, examines that line to ensure it makes sense, alerts you of any errors if it doesn't, and then executes it if everything is OK.

The disadvantage of this method is lack of speed, since as much time is spent interpreting the code as executing it. The advantage is that interpreted languages are easy to write, since you can try out a line and then fix any problems that the interpreter alerts you to.



Logo logic: This sample shows how a new command To Square is created, and the design is drawn by simply repeating the command 30 times. A Basic program would be much longer and more complicated



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Once you've got your program accepted by the interpreter, any flaws are down to your programming technique. But they're easy to fix since you can stop the program, change things, and re-run it easily.

Compiled languages require no interpreter. Instead, another program – the compiler – goes through your program and converts it into executable code. This secondary code will run extremely fast since there is no delay for interpretation.

Compilers are awkward to work with though, because you need a number of separate programs: a text editor to create the program lines, a compiler to do the compilation, and often other bits and pieces like sub-routine libraries, and linkers (for

joining different routines). Once you've produced a bit of compiled code, any bugs mean that you have to re-load the editor, re-load your original program file, make the changes, re-compile, and so on.

Different compilers generate different kinds of code. Some create native code, or machine code, and these (obviously) produce programs which execute as fast as possible. Others produce what is known as pseudo code, or p-code, and require a small block of code, called run-time code, to be tagged onto the end of your program. This is not as fast as native code, but is still much faster than interpreted programs.

Obviously, these differences produce languages with different strengths. Interpreted

languages are the easiest to work with, but are slow. Compiled languages produce fast programs but are relatively difficult to work with. Some languages are compromises and allow interpretation during program writing, so you can do quick checks on your program, but you can then compile the final program. Forth is an example of the latter.

To repeat: which language you choose as your next step from Basic will depend on what you want to do with your computer. There is also the point that languages, like most things, follow fashions. A few years ago Pascal and Forth were "in", now it's the turn of C, while Modula-2 is developing a large fan club.

The following A to Z (well, A to P actually) might help you choose.

## Ada

Very big with defence contractors since the US Department of Defense opted for Ada as the language of choice for its latest projects, including the Strategic Defense Initiative, Star Wars.

Because of the enormous resources needed to run the language it is usually confined to mainframe systems but, bizarrely, a small implementation is available for the Commodore 64.

## Algol

An acronym for ALGOrithmic Language, Algol is one of the earliest computer languages dating from the late 1950s. It was designed for mathematicians but has largely been superseded and is now little more than an historical curiosity.

## BCPL, C

BCPL and C can be considered quite similar – the latter is a development of the earlier BCPL. They are general-purpose programming languages designed to produce fast, compact programs.

Perhaps the biggest advantage of C programming is that your programs are more or less independent of machine. Most Cs tend to be identical, and the same versions are available for many machines so you can move your programs from one micro to another with very little trouble.

## Cobol

The language of business computing, this is the one to go for if you have a yen to write a quick VAT calculator. Seriously, it was the standard language for computers in business but has been largely superseded by more recent languages, or by those programs (like dBase) which are programmable for specific uses.

## Comal

An odd hybrid, developed in Scandinavia and widely adopted in schools and colleges, Comal is sort of a cross between Basic and Pascal. It is as easy to learn as Basic but supports Pascal-like features.

## Forth

Originally developed as a real-time control language (which makes it ideal for computer control of laboratory equipment, etc), Forth found a new following when it was used to program some early arcade games machines. Apart from its assets in handling input/output on these systems, Forth had one other advantage – it is very, very fast.

Forth, a compiled language, is also unusual in its structure. The language itself actually contains very few commands. You create your own customised version of the language by writing your own commands made up of these "primitives". This means that you can keep the size of your program fairly compact.

## Fortran

An acronym of FORMula TRANslation, Fortran is a powerful mathematical tool, much loved by inhabitants of science labs. If you want to use your micro as a tool to explore the secrets of the universe, Fortran could be for you. However, as with Cobol, you'll probably need CP/M or MS-DOS, although Prospero Software has Pro-Fortran for a number of machines, including the ST and QL.

## Lisp

One of the relational languages, Lisp (which stands for LISt Processing) is another language being used in AI research. The basic unit of Lisp is a list. Lists contain information, and other lists, and you query programs by asking for relationships between data and between lists. Answers can become other lists which are then related in new ways, and so it goes. If you're used to Basic programming, Lisp can be very odd – but good fun.

## Logo

Whenever they think of Logo, most people think of turtle graphics but although the turtle is the most accessible part of the language, and the most instantly appealing, Logo is actually very similar to Lisp in the way it works. Data is stored in lists, which can then be interrogated, compared to other lists, and so on.

There are also some similarities with Forth

in that Logo provides a basic vocabulary and the user then creates new commands and functions, called procedures, by combining the primitives as desired.

## Modula-2, Pascal

Pascal was written by Niklaus Wirth with the intention of creating a very logical, tightly-defined language. It is compiled, which makes for very fast programs, and is much easier to understand than languages like C. However, Pascal does not produce very compact code, which is one reason why C has overtaken it somewhat in popularity.

Rumour has it that Wirth became disenchanted with the way that Pascal was extended and added to – taking it away from his original concept – and he went back to the drawing board and designed Modula-2, an even tighter language than Pascal had been. Although Modula-2 is one of the newest languages, it has quickly developed a strong following, especially in the US.

## Pilot

Pilot is very much an oddity in the language field in that it is not a true programming language. It was developed as a sort of testbed for concepts in Computer Aided Learning. The language concept is close to Prolog and Lisp since it deals largely in textual information, but the execution is very much instructional.

It is a small language, largely consisting of commands to input and output words and sentences, compare words, and so on. Commercial Pilot packages are few and far between, but it is fairly simple to write your own in another language – even Basic.

## Prolog

Prolog has much more in common with a powerful database than with a programming language. For example, you cannot write an arcade game in Prolog, or a graphics program. Like Lisp, Prolog is designed for manipulating ideas and concepts. But for the right sort of application, such as sifting and organising information, a Prolog program will do the job quicker, and with far less effort, than a program in Basic or Pascal (the Prolog program will also be very much smaller).



# PROGRAMMERS GAMES DESIGNERS REQUIRED

We have a growing range of new games in production – on both 8 and 16 bit machines – from a number of talented design teams.

There are now plans to start further projects and we are looking for the following people.

## A Full-time Amiga Programmer

We are looking for a programmer who already has some experience working on the Amiga together with previous computing experience on other machines, preferably (but not necessarily) in games.

We are expecting to be working on a number of Amiga projects in the future so the right candidate must expect to become an integral member of the Palace team over the next few years.

Candidates may wish to work on a salaried or self-employed basis, either from our offices in Central London or from home.

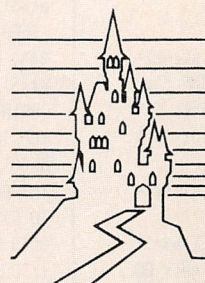
## Freelance programmers/designers

We are very interested in publishing games for 8 and 16 bit machines written and programmed by freelance designers and programmers.

You will probably be working within the business with involvement in games already published by other companies and now want to further establish your name and reputation. You will need to have the experience to see projects through from initial idea to finished programme.

If you feel you are a talented and experienced programmer/designer – working as an individual or a team – with exciting and original ideas, we would like to talk to you.

In either case phone Pete Stone at Palace Software on 01-278 0751 and tell him all about yourself.



**PALACE**  
software



## Popular Superbowl

Duncan Evans

Last week of the listing and a brief description of the outcome of the defensive plays. Blitzing the quarterback is a good idea if it comes off; you can drive the opposition back some yards or recover the ball if they are passing. Failure to sack the QB results in

a bigger yardage gain for the offense.

Prevent rush is good on QB sneak or running plays but not so for a pass play.

Prevent pass obviously defends against the QB throwing the ball thus conceding yardage if the opposition runs the ball.

When the opposition brings out their special team it's either for a field goal attempt or a punt. Covering the punt means that a man stays back to receive the ball and runs it back upfield.

For each half of the match you have three time outs which add 15 seconds to the clock and can be used when prompt-

ed. The computer makes logical decisions on when to use its own time outs.

Now, if you think there are too many points being scored in the game alter the variables between lines 140 and 330. They give the percentage chance of carrying out a play successfully and the spread can easily be narrowed down.

Note that all the characters in quotes between lines 8000-8800 and lines 9330-9380 should be entered as graphic characters.

For a copy of Popular Superbowl on cassette send £2.00 to D Evans, 19 Veronica Road, London SW17 8QL.

```

7130 IF ball<1 AND pos=0 AND oplay<4 IH
EN LET cscore=cscore+2: PRINT AT 20,8;
BRIGHT 1;"!! SAFETY !!": GO TO 7210
7135 IF ball>99 AND pos=1 AND oplay<4 T
HEN LET yscore=yscore+2: PRINT AT 20,8;
BRIGHT 1;"!! SAFETY !!": GO TO 7210
7170 IF ball>99 AND oplay=4 THEN LET ba
ll=80: GO SUB pblank: PRINT AT 16,11; BR
IGHT 1;"Punt dead";AT 17,8;"Play on <20
yrd": GO TO 7600
7180 IF ball<1 AND oplay=4 THEN LET bal
l=20: GO SUB pblank: PRINT AT 16,11; BRI
GHT 1;"Punt dead";AT 17,8;"Play on >20 y
rd": GO TO 7600
7190 IF ball>99 AND oplay=5 THEN LET ys
core=yscore+3: PRINT AT 20,8; BRIGHT 1;"
!! FIELD GOAL !!"
7200 IF ball<1 AND oplay=5 THEN LET csc
ore=cscore+3: PRINT AT 20,8; BRIGHT 1;"!
! FIELD GOAL !!"
7599 REM Down
7600 LET down=down+1: IF down<5 THEN GO
TO 7800
7650 GO SUB pblank: PRINT AT 16,8; BRIGH
T 1;"End of drive"
7660 LET ytgo=10: LET down=1: IF pos=1 T
HEN GO TO 7690
7670 LET pos=1: PRINT AT 18,7; BRIGHT 1;
c$;" recover";AT 19,11;"ball"
7680 GO TO 7700
7690 LET pos=0: PRINT AT 18,7; BRIGHT 1;
y$;" recover";AT 19,11;"ball"
7700 GO SUB get
7799 REM time
7800 LET stime=time-15: IF win=0 THEN
LET stime=time-15
7805 IF stime<=0 THEN LET stime=stime+6
0: LET mtime=stime-1
7810 IF mtime<0 THEN LET mtime=14: LET
quart=quart+1
7815 GO SUB ballon
7820 IF quart=3 AND mtime=14 AND stime>=
45 THEN LET m=1: LET m$="HALF TIME !":
GO SUB mess: GO SUB get: LET down=1: LET
ytout=3: LET ctout=3: LET ytgo=10: IF k
o=0 THEN LET pos=1: GO TO 1020
7830 IF quart=3 AND mtime=14 AND stime>4
4 THEN LET pos=0: GO TO 1050
7840 IF quart=5 THEN LET m=1: LET m$="E
nd of game": GO SUB mess: GO SUB get: GO
TO 9500
7850 LET m=1: LET m$="Time out ? (Y/N)":

```

```

GO SUB mess
7855 LET b$=INKEY$: IF b$="" THEN GO TO
7855
7860 IF b$="y" AND ytout>0 THEN LET yto
ut=ytout-1: LET stime=stime+15
7865 IF ctout>0 AND (mtime<2 AND cscore<
yscore AND pos=1 AND (quart=2 OR quart=4
)) THEN LET ctout=ctout-1: LET stime=st
ime+15
7875 IF down=1 AND pos=0 AND jsc=1 THEN
LET jsc=0: GO TO 1050
7880 IF down=1 AND pos=1 AND jsc=1 THEN
LET jsc=0: GO TO 1020
7890 IF pos=0 THEN GO TO 4000
7900 GO TO 1100
8000 REM Action reports
8010 IF pos=0 THEN PRINT AT 5,x-1;"D B"
: BEEP .06,1: GO TO 8990
8020 PRINT AT 5,x;"A C": BEEP .06,1: GO
TO 8990
8100 IF RND*11>5 THEN LET a=3: GO TO 81
20
8110 LET a=7
8120 IF pos=0 THEN PRINT AT a,x;"AB";AT
a,x+1;"C": FOR f=x+1 TO x+5: PRINT AT a
,f;"CC": BEEP .1,10: NEXT f: PRINT AT a
,x+1;"D": FOR f=x+1 TO x+3: PRINT AT a,f;
"DD": BEEP .075,20: NEXT f: PLOT (x*8-2
),128: DRAW 36,(5-a)*8,-1: GO TO 8990
8130 PRINT AT a,x;"AB";AT a,x;"D": FOR f
=x-1 TO x-5 STEP -1: PRINT AT a,f;"DD":
BEEP .1,10: NEXT f: PRINT AT a,x+1;"C":
FOR f=x TO x-3 STEP -1: PRINT AT a,f;"CC
": BEEP .075,20: NEXT f: PLOT ((x)*8+22
),128: DRAW -44,(5-a)*8,1: GO TO 8990
8200 GO TO 8800
8300 GO TO 8000
8400 IF pos=0 THEN PLOT (x*8),128: DRAW
(y-x+(puret/5))*8,10,-1.7: FOR f=y+(pur
et/5) TO y STEP -1: PRINT AT 4,f-1;"DD":
BEEP .25,20: NEXT f: GO TO 8990
8440 PLOT (x*8+16),128: DRAW (y-x-1-(pur
et/5))*8,10,1.7: FOR f=y-(puret/5) TO y:
PRINT AT 4,f;"CC": BEEP .25,20: NEXT f:
GO TO 8990
8500 IF pos=0 THEN FOR f=x-1 TO y-1: PR
INT AT 5,f;"CC": BEEP .1,10: NEXT f: GO
TO 8990
8510 FOR f=x+1 TO y STEP -1: PRINT AT 5,
f;"DD": BEEP .1,10: NEXT f: GO TO 8990
8600 LET a=INT (RND*5+3): IF pos=0 THEN
PRINT AT a,x;"AC": FOR f=x+1 TO y-1: PR

```

```

INT AT a,f;"CC": BEEP .06,1: NEXT f: GO
TO 8990
8610 PRINT AT a,x;"DB";AT a,x+1;"D": FOR
f=x TO y STEP -1: PRINT AT a,f;"DD": BE
EP .06,1: NEXT f: GO TO 8990
8700 IF RND*11>5 THEN LET a=3: GO TO 87
20
8710 LET a=7
8720 IF pos=0 THEN PRINT AT a,x;"AC": F
OR f=x+1 TO y-1: PRINT AT a,f;"CC": BEEP
.1,15: NEXT f: PLOT (x*8-2),128: DRAW (
y-x+1)*8,(5-a)*8,-1: GO TO 8990
8730 PRINT AT a,x;"DB": FOR f=x-1 TO y S
TEP -1: PRINT AT a,f;"DD": BEEP .1,15: N
EXT f: PLOT (x*8+16),128: DRAW (y-x-2)*8
,(5-a)*8,1: GO TO 8990
8800 PLOT (x*8-2),128: IF pos=0 THEN DR
AW (y-x+1)*8,-8,-1.7: GO TO 8990
8810 PLOT (x*8+16),128: DRAW (y-x-2)*8,-
8,1.7: GO TO 8990
8900 PLOT (x*8-2),128: IF pos=0 THEN DR
AW (26-x)*8,2,-2: GO TO 8990
8910 PLOT (x*8+16),128: DRAW -(x-1)*8,2,
2
8989 REM text report
8990 OVER 0: GO SUB pblank: BRIGHT 1: PA
PER 7: IF pos=0 THEN PRINT AT 15,8;y$;"
try";AT 17,8;c$;" try to": GO TO 8994
8992 PRINT AT 15,8;c$;" try";AT 17,8;y$;
" try to"
8994 PRINT AT 16,8;a$(oplay);AT 18,8;a$(
dplay+5)
8995 IF win=0 THEN PRINT AT 19,8;gain;"
yard gain"
9000 IF puret>0 THEN PRINT AT 20,7;"Fun
t return ";puret;"yd"
9010 IF win=1 THEN PRINT AT 19,8;"!! FU
MBLE !!"
9020 IF win=2 THEN PRINT AT 19,8;"! INT
ERCEPTED !"
9030 IF win=4 THEN PRINT AT 19,8;"KICK
BLOCKED"
9040 IF win=3 THEN PRINT AT 19,8;"PUNT
CAUGHT"
9050 BRIGHT 0: RETURN
9299 RETURN
9300 REM Graphics set up
9310 BRIGHT 0: FOR f=0 TO 11: PRINT AT f
,0;" PAPER 1;"
" : NEXT f
9320 FOR f=1 TO 10: PRINT AT f,3;" PAPER
2;" ;AT f,24;" ;AT f,4;" PAPER 4;"

```



```

: NEXT f
9325 PRINT AT 0,3;"0";AT 0,13;"50";AT 0,
24;"0": FOR f=39 TO 199 STEP 8: OVER 1:
PLOT f,169: DRAW 0,-82: NEXT f: PLOT 112
,169: DRAW 0,-82
9330 PRINT AT 4,1; PAPER 1; INK 6;"E";AT
4,26;"E";AT 5,1;"F";AT 5,26;"F";AT 6,1;
"6";AT 6,26;"6"
9340 PRINT AT 0,28; PAPER 2;" "; PAPER 7
;"QTR";AT 1,28; PAPER 2;" "; PAPER 7;" "
;quart;" ";AT 2,28; PAPER 2;" ";
9345 LET x=3+INT (ball/5): IF pos=0 THEN
LET y=4+INT ((ball+gain)/5): GO TO 935
0
9348 LET y=4+INT ((ball-gain)/5)
9350 IF x<3 THEN LET x=3
9351 IF y<3 THEN LET y=3
9352 IF x>24 THEN LET x=24
9353 IF y>24 THEN LET y=24
9355 BRIGHT 0: PAPER 4: FOR f=3 TO 7: PR
INT AT f,x;"AB": NEXT f: IF pos=0 THEN
PRINT AT 5,x-1;"C"
9360 IF pos=1 THEN PRINT AT 5,x+2;"D":
IF dplay=5 THEN PRINT AT 4,y-(puret/5);
"C"
9380 IF pos=0 AND dplay=5 THEN PRINT AT
4,y+(puret/5);"D"
9390 BRIGHT 0: OVER 0: RETURN
9400 REM Data
9410 DATA "QB sneak","running ball","pas

```

```

sing ball","punting","field goal","Blitz
QB","prevent rush","prevent pass","bloc
k kick","cover punt"
9420 DATA 0,6,6,8,22,40,36,228
9430 DATA 0,192,192,32,208,40,72,78
9440 DATA 12,12,24,14,8,20,18,2
9450 DATA 48,48,24,112,16,40,68,64
9460 DATA 195,195,195,195,195,195,19
5
9470 DATA 195,195,195,195,195,195,255,25
5
9480 DATA 24,24,24,24,24,24,24,24
9500 REM End of game
9510 FOR f=0 TO 6: PAPER f: BORDER f: CL
S : BEEP .05,RND*30: NEXT f: BORDER 6
9520 PRINT AT 9,10;y%;" " ;yscore;AT 11,1
4;"v";AT 13,10;c%;" " ;cscore
9530 INK 2: PLOT 76,107: DRAW 88,0: DRAW
0,-48: DRAW -88,0: DRAW 0,48
9540 INK 0: PRINT AT 20,2;"Press any key
to play again": GO SUB get: RUN
9599 REM TOUCHDOWN
9600 IF pos=0 THEN LET y=3
9610 IF pos=1 THEN LET y=2
9620 FOR f=15 TO 20: PRINT AT f,7; INK 6
; PAPER y;"!!!! TOUCHDOWN !!!": BEEP .1,
f: NEXT f
9630 FOR f=1 TO 100: NEXT f: RETURN
9700 REM Ballon
9705 BRIGHT 0: PAPER 5: PRINT AT 16,31;"
";AT 18,31;" "

```

```

9710 IF ball<=50 THEN PRINT AT 16,25;">
";AT 16,26;ball;" yrd"
9712 IF ball>50 THEN PRINT AT 16,25;"<"
";AT 16,26;100-ball;" yrd"
9730 PRINT AT 18,25;ytgo;" yds"
9740 PRINT AT 20,28;down
9750 PRINT AT 16,2;yscore;AT 18,2;cscore
;AT 20,0;" ";AT 20,1;mtime;" ";sti
me
9760 PRINT AT 16,6;ytout;AT 18,6;ctout;A
T 16,5; INVERSE 1;"T";AT 18,5;"T": PAPER
7: RETURN
9800 REM rblank
9810 FOR f=16 TO 20 STEP 2: PRINT AT f,2
5; PAPER 5;" ": NEXT f: RETURN
9850 REM pblank
9860 PAPER 7: FOR f=15 TO 20: PRINT AT f
,7; BRIGHT 1;" ": NEXT
f: RETURN
9900 REM message
9905 IF m=2 THEN GO TO 9920
9910 PAPER 7: BRIGHT 0: FOR f=12 TO 13:
PRINT AT f,0;" "
: NEXT f: PRINT AT 11+m,15-INT (L
EN m)/2;m%; RETURN
9920 PRINT AT 11+m,15-INT (LEN m)/2;m%;
RETURN
9950 REM get
9960 IF INKEY$="" THEN GO TO 9960
9970 BEEP .1,3: RETURN

```

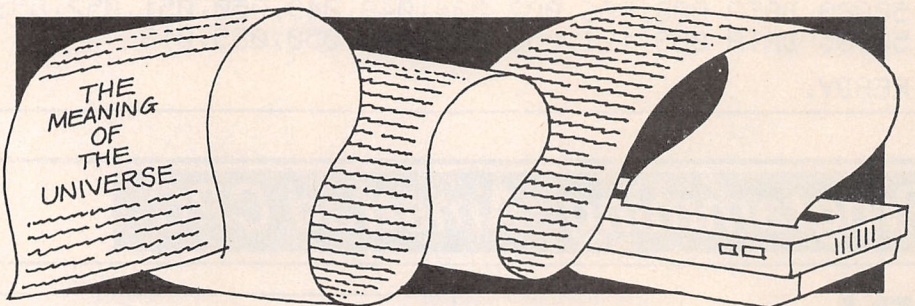
## Programming: QL

### Filesort

L A Privett

**T**his program for the QL will, when run, create a file containing a directory (of a device in line 140) in alphabetical order.

The sorted array is then saved to a file to be used by the user for reference purposes.



```

150 dev$='Mdv2_'
160 temp$='Temp_Directory_File'
170 sort$='Sorted_Directory_File'
180 DIM Array$(120,36)
190 WINDOW 448,216,16,0:BORDER 1,2
195 PAPER 7:INK 0
200 MODE 4
210 :
220 :
225 PRINT\,'Deleting ' ;dev$;temp$
230 DELETE dev$;temp$
232 :
234 PRINT\,'Creating ' ;dev$;temp$
240 OPEN_NEW#4,dev$;temp$;DIR#4,dev$;CLOSE#4
242 :
244 PRINT\,'Opening ' ;dev$;temp$
250 OPEN_IN#4,dev$;temp$
255 :
260 number=0
266 PRINT\,'Getting ' ;dev$;temp$; ' into array'

```

```

270 REPEAT scan_file
280 IF EOF(#4):EXIT scan_file:END IF
290 INPUT#4,Array$(number)
300 number=number+1
310 END REPEAT scan_file
320 CLOSE#4
330 :
340 PRINT\,'Now Sorting File !'
350 pass_num=1
360 REPEAT Scan_sort
370 Sorted=1
380 FOR Pass=2 TO number-1
390 IF Array$(Pass)>Array$(Pass+1)
400 file$=Array$(Pass+1)
410 Array$(Pass+1)=Array$(Pass)
420 Array$(Pass)=file$
430 Sorted=0
440 END IF
450 END FOR Pass
460 AT 13,0

```

```

470 PRINT\,'Pass ' ;pass_num
480 IF Sorted THEN EXIT Scan_sort:END IF
490 pass_num=pass_num+1
500 END REPEAT Scan_sort
505 :
510 PRINT\,'Sorting Completed !':INK 2
520 PRINT\,'Press a Key to Continue !':PAUSE
530 SAVE_FILE
540 PAUSE 60:CLS:COPY dev$;sort$ TO scr
550 STOP
560 :
620 DEFINE PROCEDURE SAVE_FILE
630 DELETE dev$;sort$
640 PRINT\,' Now Saving Data'
650 OPEN_NEW#4,dev$;sort$
660 FOR f=0 TO number
670 PRINT#4,Array$(f)
680 END FOR f
690 CLOSE#4
700 END DEFINE

```



## Data Maker

D W Light

Instead of laboriously typing out data statements for your latest machine code masterpiece, to send to a magazine, you can simply run this program which will do the job for you.

It also provides leading zeros to the data to give it a neater look.

The start address of the code should be poked into 251 (low byte) and 252

(high byte).

The number of bytes should be poked into 253 (low byte) and 254 (high byte).

The low and high byte values can be found by using the following formula.

$HB = \text{Int}(\text{Address}/256)$ ;  $LB = \text{Address} - (HB*256)$

Enter SYS 50000 to call the routine.

```
100 POKE53280,3:POKE53281,5:POKE646,0
110 PRINT"DATA"TAB(14)"READING DATA"
120 A=50000:D=0
130 FORB=0TO279
140 READC:POKEA+B,C:D=D+C:NEXT
150 IFD=32938THENPRINT"CORRECT":END
160 PRINT"ERROR IN DATA STATEMENTS, PLEASE CHECK !"
170 PRINT:PRINT"MY NUMBER = 32938","YOUR NUMBER ="D
180 STOP
200 :
50000 DATA 169,053,141,052,003,169,048,141,053,003,141,054,003,141,055,003
50005 DATA 169,043,141,056,003,169,016,133,255,160,000,024,162,004,189,052
50010 DATA 003,105,005,201,058,144,002,233,010,157,052,003,202,189,052,003
50015 DATA 105,000,201,058,144,002,233,010,157,052,003,202,016,239,169,147
50020 DATA 032,210,255,232,189,052,003,032,210,255,232,224,005,208,245,169
50025 DATA 068,032,210,255,169,097,032,210,255,169,032,032,210,255,162,000
50030 DATA 134,002,134,249,134,250,177,251,240,055,016,012,041,127,232,134
50035 DATA 002,232,134,249,162,008,134,250,162,008,202,048,036,010,144,250
50040 DATA 072,024,165,250,125,077,196,201,010,144,002,233,010,133,250,165
50045 DATA 249,125,070,196,201,010,144,004,233,010,230,002,133,249,104,208
50050 DATA 217,200,208,002,230,252,166,002,189,084,196,032,210,255,166,249
50055 DATA 189,084,196,032,210,255,166,250,189,084,196,032,210,255,198,253
50060 DATA 208,021,165,254,208,015,169,019,141,119,002,169,013,141,120,002
50065 DATA 169,002,133,198,096,198,254,198,255,240,008,169,044,032,210,255
50070 DATA 076,174,195,169,016,133,255,162,010,134,198,202,189,094,196,157
50075 DATA 119,002,202,016,247,096,000,000,000,000,001,003,006,001,002,004
50080 DATA 008,006,002,004,048,049,050,051,052,053,054,055,056,057,019,013
50085 DATA 083,121,053,048,048,050,055,013

READY.
```

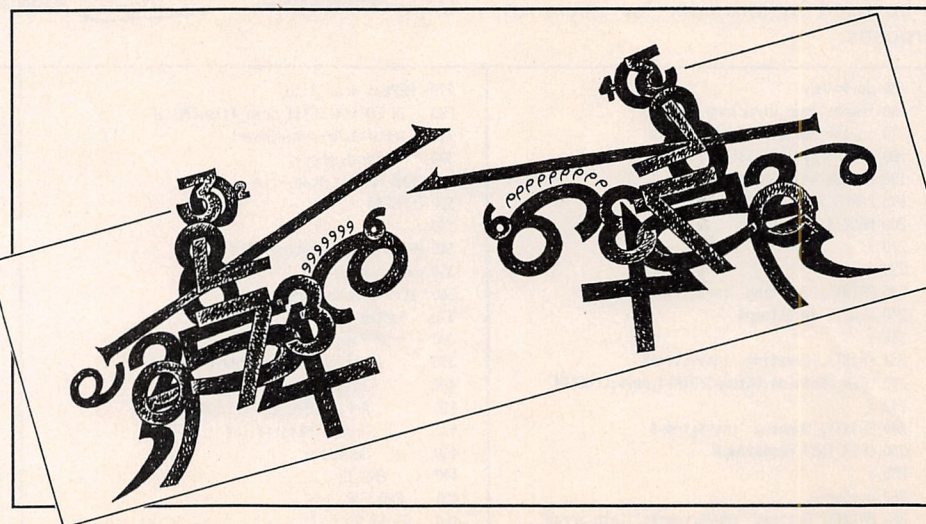
## Programming: Amstrad CPC

### Disc Menu

Alastair Scott

This program provides an intelligent menu which does not need to be updated each time you add a program to the disc.

Just type it in, save it to disc and run it when needed. Wait a few moments and the list of filenames will appear. Move the cursor with the keyboard controls or joystick and press *Space* or *Fire* to select.





<pre> 100 ' Intelligent Disc Menu 110 ' by Alastair Scott 120 GOSUB 530 130 GOSUB 400 140 GOSUB 300 150 ch=1:GOSUB 280 160 ' Move cursor 170 WHILE INKEY(47)AND INKEY(76) 180 IF NOT INKEY(0)OR JOY(0)AND 1 THEN G OSUB 270:ch=ch+(ch&gt;1):GOSUB 280 190 IF NOT INKEY(2)OR JOY(0)AND 2 THEN G OSUB 270:ch=ch-(ch&lt;1):GOSUB 280 200 CALL &amp;A605:WHILE TIME&lt;100:WEND 210 WEND 220 ' Load program 230 WHILE INKEY&lt;&gt;"":WEND:SOUND 1,100,0, 0,1:chosen=name\$(ch) 240 CLS:IF INSTR(chosen\$,".BIN")THEN LDA D chosen\$ELSE RUN chosen\$ 250 END 260 ' Highlight name 270 LOCATE cx(ch),cy(ch):PRINT name\$(ch) </pre>	<pre> :RETURN 280 LOCATE cx(ch),cy(ch):PRINT CHR\$(24)n ame\$(ch)CHR\$(24):RETURN 290 ' Print names 300 MODE 1:INK 1,24:PEN 2 310 LOCATE 12,1:PRINT"PROGRAMS ON DISC": PEN 3 320 LOCATE 1,25:PRINT"USE "CHR\$(240)" AN D "CHR\$(241)" THEN SPACE OR FIRE TO SELE CT"; 330 PEN 1:y=3:pr=ROUND(f1/2) 340 FOR a=1 TO f1 350 y=y+1-(f1&lt;21):IF a=pr+1 THEN y=4-(f1 &lt;21) 360 cx(a)=4+(20 AND a&gt;pr):cy(a)=y 370 LOCATE cx(a),cy(a):PRINT name\$(a) 380 NEXT:RETURN 390 ' Copy names from catalogue 400 CLS:SOUND 1,50,0,0,1:CAT 410 FOR x=1 TO 61 STEP 20 420 y=4:LOCATE x,y:CALL &amp;A600,@chr 430 WHILE chr&lt;&gt;32:copy\$="" </pre>	<pre> 440 FOR z=0 TO 11 450 LOCATE x+z,y:CALL &amp;A600,@chr 460 copy\$=copy\$+CHR\$(chr) 470 NEXT 480 name\$(f1)=copy\$:f1=f1+1:y=y+1 490 LOCATE x,y:CALL &amp;A600,@chr 500 WEND 510 NEXT:f1=f1-1:RETURN 520 ' Initialise 530 MODE 2:INK 0,0:INK 1,0:INK 2,18,6:IN K 3,14:BORDER 0:PAPER 0:PEN 1 540 ON BREAK GOSUB 590:ON ERROR GOTO 590 :MEMORY &amp;A5FF:ENV 1,15,-1,3:DEFINT a-z 550 FOR a=1 TO 14:POKE &amp;A5FF+a,VAL("&amp;"M ID\$("CD60BB12C9110000210000C310BD",a*2-1 ,2)):NEXT 560 f1=1:chr=0:DIM name\$(64),cx(64),cy(6 4) 570 RETURN 580 ' Set readable colours on error 590 MODE 1:INK 1,26:PEN 1:SOUND 1,25,0,0 ,1:END </pre>
---	---	---

## Programming: BBC/Electron

### Locker

David Yip

**T**his two part program will enable you to lock your *Basic* programs so that they can only be loaded with \*Run, which makes the program automatically run when it does load.

Type in and save the two programs in order then load and run the first one. You will be prompted to load the program you want locked, and after the process is complete, asked to press return to save the locked version.

```

1REM * B-LOCK 2 *
2CLS
3PRINT "PLAY YOUR PROGRAM"
4*LOAD""E00
5T=&E00+?&3C6*256+?&3C8
6P%=T:[OPT2
7LDA#13B:LDX#0
8.L:L DY(T+30),X
9INX:STX&70:LDX#0
10JSR&FFF4:LDX&70
11CPX#8:BMIL:RTS:]

```

```

12!(T+30)=&D2E4F0D:!(T+34)=&D4E5552
13B$=""X=&3B2
14REPEAT:B$=B$+CHR$?X
15X=X+1:UNTIL?X=0
16PRINT "Insert NEW TAPE and SAVE LOC
KED PROGRAM"
17CALL&7C
18OSCLI"SAVE "+B$+" E00 "+STR$(T+39)
+" "+STR$*T
19GOTO18

```

```

30 MODE6
40 PRINT'SPC(17);"B-LOCK"
50 PRINT'SPC(16);"by D.YIP"
60 PRINT'=====
=====
70 VDU 28,0,24,39,6
80 PRINT"This program CAN'T LOCK M/C
programs"
90 PRINT"BASIC program MUST be PAGED
at &E00"
100 P%=&71
110 [OPT2
120 LDA &3CA
130 ORA #1
140 STA &3CA
150 JMP (&8A)
160 SEI

```

```

170 LDA #&71
180 STA &204
190 LDA #0
200 STA &205
210 CLI
220 RTS
230 ]
240 !&8A=!&204
250 !&8B=&3D2E480D
260 !&8BA=&30304426
270 !&8BE=&4741500D
280 !&892=&42263D45
290 !&896=&4F0D3030
300 !&89A=&55520D2E
310 !&89E=&00000D4E
320 P%=&2000
330 [OPT2

```

```

340 LDA #13B
350 LDX #0
360 .L
370 LDY &886,X
380 INX
390 STX &70
400 LDX #0
410 JSR &FFF4
420 LDX &70
430 CPX #26
440 BMI L
450 RTS
460 ]
470 COLOUR0:COLOUR 129
480 PRINT " PLEASE WAIT "
490 COLOUR1:COLOUR 128
500 *LOAD"LOCK"BOO
510 CALL &2000

```



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## Split Screen

J Giddens

**T**his routine for the Oric computer allows you to have a screen split between low resolution text and high resolution graphics.

```
10 HIRES :TEXT
20 PRINT CHR$(30);CHR$(27);CHR$(127)
30 DOKE#26D,48640
40 POKE#26F,11
50 REM ... HIRES COMMANDS
60 POKE#2C0,1:DRAW10,10,1:DRAW100,10,1
70 REM ... TEXT COMMANDS
80 POKE#2C0,2:PLOT17,17,33
```

## Reset

Tim Blacklock

**T**his program for the Spectrum allows you to protect your Basic programs so that if anyone tries to Break into them the computer resets itself.

Simply add these four lines to the beginning of your program to protect it.

```
10 POKE 23613,2
20 POKE 23614,91
30 POKE 23298,0
40 POKE 23299,0
50 REM rest of program
```

## C128 Dump

M J Curtis

**W**ith this program for the Commodore 128 you can dump a high resolution screen to the Commodore MPS 803 printer.

```
10 DIMSP$(7,67)
20 FORL=1TO7:FORM=1TO67:SP$(L,M)=CHR$(0):
NEXTM,L
30 FOR I=0TO6
40 : SP$(I+1,I*3+1)=CHR$(128)
50 : FORJ=1TO67
60 : A$(I+1)=A$(I+1)+SP$(I+1,J)
70 : NEXTJ
80 : SPRSAV A$(I+1),I+1
90 NEXTI
140 GRAPHIC 1
150 OPEN#4:PRINT#4,CHR$(8);
170 FORN=1TO7:SPRITEN,1,2,0:NEXTN
200 FORV=50TO250 STEP7
220 : FORX=24TO344
230 : FORP=1TO7
240 : MOVSPRP,X,Y
250 : NEXTP
260 : FORN=1TO10
```

```
270 : NEXTN
280 : PRINT#4,CHR$(BUMP(2)+128);
290 : NEXTX
300 : PRINT#4
310 NEXTV
320 PRINT#4,CHR$(15):CLOSE#4:GRAPHIC0
```

## We want your programs!!

**Y**es, this is your chance to get rich and famous. Well, famous anyway, as *Popular Computing Weekly* is looking for contributions to the Programming pages.

What sort of thing are we looking for? You name it – anything original from games to utilities, applications and the like, written in Basic, machine code or anything else you can think of.

Programs for any computer will be considered, not just the old faithfuls

(Spectrum, Amstrad, QL, Commodore, etc), so send those listings in. What we need is a working copy of the program on tape or disc, plus an accompanying article or documentation that you would anticipate going with the piece, normally not over 2000 words.

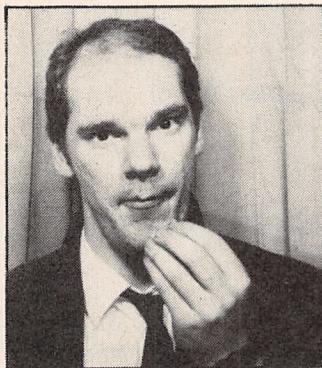
Alternatively, send in your short programs to the Bytes and Pieces page – what could be easier?

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with Kenn Garroch

## Utopian ideals

Peter Ceresole, of London SW14, writes:

**Q** I have a CPC 6128 with *Protext/Promerge*. I also have *Utopia*, but I would like to be able to trace the files through their sectors and tracks.

I can read the directory using *Dedit*, and I know the meaning of the various attribute bytes, user, RW/RO, etc, but I cannot understand the meaning of the line of bytes giving the position of the file on disc. I know that there are utilities that do this for you, like *The Knife*, but *Utopia* is thoroughly integrated with my other programs, and is on Rom, so which suits me best?

**A** Presumably, the directory is set out in the standard way for CP/M, in which case, the following information should allow you to trace files without resorting to another piece of software, that is, if *Dedit* will give you direct access to the directory track information. If it doesn't, then DDT can be used to examine the FCB (File control block) in the following way. Get into DDT by typing *DDT* which will load and run the program (should be on the CP/M system disc). The FCB is located at 5C onwards so entering *d5c,7f* will display the first part of the FCB. At this point, there will not be a great deal of information there. You will need to read the directory information from the disc by opening the file. The following program

typed in from DDT will do this.

```
-a100
0100 mvi c,f
0102 lxi d,5c
105 call 5
108 rst 7
109 <<type return to get out of
assem mode>>
```

Then type *ifilenm,ext* to set up the file to be loaded and then *g100* to open the file. Examining the FCB with *d5c,7f* will now display the directory information for the file.

Byte	Contents	Meaning
0	00	Set to 0 if file is valid, E5 if erased
1	F	
2	I	
3	L	Eight
4	E	byte
5	N	filename
6	M	
7		Padded with space (20 hex)
8		
9	E	Three byte
10	X	file
11	T	extension
12	00	Extent
13	00	s1
14	00	s2
15	4A	Number of records in this extent (example Nos)
16	26	The
17	69	rest
18	79	are
19	7A	allocation
20	7B	units
21	7E	which
22	80	are
23	83	set
24	84	to
25	85	zero
26	00	if
27	00	they
28	00	are
29	00	unused
30	00	
31	00	

When you get to the last block, it may not be full, the remainder of the 'number or records' entry divided by eight will tell you how many records are used.

Hopefully this solves your problem, I do not, unfortunately, know anything about the pieces of software you mention but for more information try *Soul of CP/M*, by Mitchell Waite & Robert Lafore (published by Howard W Sams & Co Inc of 4300 West 62nd Street, Indianapolis, Indiana 46288 USA) or any other of the many CP/M texts available.

These 32 bytes tell the operating system all the information it needs to know about the file. The filename and extension are obvious. Files are stored on disc as

records of 128 bytes, each allocation unit represents 8 records, and there is space in one directory entry for 16 allocation units, hence  $16 \times 8 \times 128 = 16384$  bytes. The extent entry is used when the file exceeds 16K.

If this happens, another extent is opened up creating a new directory entry with the same filename and type but with the extent number set to 1 (or more if the file is really big, calling for more directory entries).

The allocation units are stored in the directory entry from byte 16 to 31 (16 entries as above) and each refers to a block of eight sectors each sector being 128 bytes long. The blocks are numbered sequentially from track 0 sector 0 through the last track and sector (depending on the density).

So to find where a file is stored on disc, look at the allocation units, and then read the eight consecutive sectors that each one points to.

In your example, the first block is stored in block 26 (38 decimal) or sector 304 ( $38 \times 8$ ); just divide by the number of sectors per track to get the track number, the remainder is the sector on this track where the file starts. At the end of this block, use the next allocation number to work out the position of the next block.

## Taking (and selling) liberties

P J Harvey of Westcliff-on-Sea, Essex, writes:

**Q** I retired in November and bought myself an Amstrad PCW 8256 which I thought would be helpful to me, but I realise now that I've bought a machine that is rather beyond me at my age and I should have bought a simpler computer.

I would like to exchange it, therefore, but I am rather worried regarding the End User Program Licence Agreement which strikes me as rather unusual for a computer being used at home for

personal reasons only, and I must admit that I haven't yet sent the registration card to Digital Research. I have opened only the first discette, the other one is still sealed. The licence agreement talks about a transfer fee!

What do you think is the best course open to me now? I accept that I will lose a fair bit of cash by exchanging or selling, but I put that down to my own foolishness and more important to me is that I do the right thing under the laws governing computers - whatever they may be!

I have thought of approaching Amstrad itself regarding the exchange to a simpler cheaper system, but I think I should seek your advice first as I now find the whole thing rather worrying.

I have only used the computer and printer a few times so it is almost new.

**A** As far as I know, there are no 'laws' governing the use and licensing of computers except for the data protection act which only applies to information stored via the machine. There are, however, customer protection laws which should cover some of your problems, ie, since you bought the machine, it is yours to do with as you wish.

The licence agreement is more to prevent unauthorised copying of the software than resale. The law in this matter is, as far as I know, the same as that covering any other printed matter (the copyright is generally regarded as the same situation).

In this case all you should make sure of is that the software is not sold in a different cover or packaging than the original form in which you received it. Having opened and used a disc puts you under no obligation whatsoever and I should imagine that there are quite a few people who have not sent back their registration cards.

On the whole, if you want to sell your computer and software, you are quite at liberty to do so at whatever price you can get without having to pay transfer fees, etc.



# MicroLink, courtesy of Debenhams

*David Wallin has news of cheaper way to accessing the MicroLink network*



continued on page 38 ►

One thing that has put many people off joining MicroLink, run by the Manchester company Database, is the cost of the telephone calls. Whilst you can access MicroLink via PSS there are still many people who don't have PSS on a local call and many people can't really afford the £50 a quarter plus bulletin board use charge.

Thanks to chain store Debenhams(!) their problem may now be over.

Debenhams has now set up its own data-network system, similar to PSS, but with many more access ports. MicroLink is available from these ports giving, claims Database, 120 new ways to access MicroLink.

The actual figure has been jiggled a bit to get this number, but there are 42 towns with Debenhams ports, making a total of about 50 new numbers, while PSS is only available in about 20 towns.

Most ports on the Debenhams network (Datec/Comshare) are both 1200/75 and 300/300, Table two (right) lists all the Datec/Comshare access ports, their numbers and their speeds.

It seems to work as well as direct dial/PSS, too. I've used the Canterbury access port and I've had no problems with it, though it was a bit slower than PSS and a good deal slower than direct dial, although I have heard that some people have had a few problems.

One complaint I have is the fact that there is no provision for 1200/1200, which is the speed I use whenever possible. Personally, I don't use the Datec/Comshare route often as data is sent much faster at 1200/1200, but if you only use 300/300 or 1200/75 then it could be worth while using the Debenhams system. The costs of using each method are given in table one (below).

## Using the new system

When using Datec/Comshare, there is a surcharge of 2.5p a minute if you use 300/300 and 3p a minute if you use 1200/75 - this is the same with PSS.

There is no change to the connect charge of 3.5p a minute. Table one excludes this 3.5p as it is the same however you connect to MicroLink. Also, table one assumes one unit to be 5p when in fact it is 5.06p (both inclusive of Vat. One unit = 4.4p excluding Vat).

**Table 2: Phone numbers to access Telecom Gold/MicroLink through the Datec/Comshare rate.**

Location	Tel no.	1200/75	300/300	PSS?
Aberdeen	0224 573405	.	.	.
Aberdeen	0224 580281	.	.	.
Belfast	0232 249290	.	.	.
Bedford	0234 218233	.	.	.
Birmingham	021-233 4165	.	.	.
Birmingham	021-704 4011	.	.	.
Birmingham	021-705 7070	.	.	.
Bournemouth	0202 25542	.	.	.
Brighton	0273 203551	.	.	.
Bristol	0272 279977	.	.	.
Bristol	0272 215481	.	.	.
Bromley	01-460 5100	.	.	.
Cambridge	0223 351312	.	.	.
Canterbury	0227 67571	.	.	.
Cardiff	0222 384511	.	.	.
Cardiff	0222 372471	.	.	.
Carlisle	0228 31667	.	.	.
Chelmsford	0245 87512	.	.	.
Chester	0244 310073	.	.	.
Chester	0244 47002	.	.	.
Croydon	01-680 9695	.	.	.
Derby	0332 31727	.	.	.
Dundee	0382 25492	.	.	.
Eastbourne	0323 645361	.	.	.
Eastbourne	0323 647422	.	.	.
Edinburgh	031-225 8509	.	.	.
Exeter	0392 215355	.	.	.
Folkestone	0303 43771	.	.	.
Glasgow	041-880 5432	.	.	.
Gloucester	0452 503959	.	.	.
Grange O/Sands	04484 4661	.	.	.
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**Table 1: Comparative costs of use of direct dial against use of PSS/Debenhams network to access MicroLink. Times are in minutes, cost in pence. All times assume cheap rate and network costs assume a local call is used.**

Time	Direct Dial			Debenhams/PSS	
	L	b	b1	300/300	1200/75
1	5	10	5	7.5	8
2	5	15	10	10	11
3	5	20	15	12.5	14
4	5	30	20	15	17
5	5	35	25	17.5	20
6	5	40	30	20	23
7	10	50	35	27.5	31
8	10	55	40	30	34
9	10	60	45	32.5	37
10	10	70	50	35	40
11	10	75	55	37.5	43
12	10	80	60	40	46
13	15	90	65	47.5	54
14	15	95	70	50	57
15	15	100	75	52.5	60
60	50	400	300	200	230



◀ continued from page 37

To use Datec/Comshare to log on to MicroLink will at first seem more complicated than PSS, but it is in fact fairly straightforward.

The first step is to dial the number (refer to table two for a complete list of Datec/Comshare access modes and their numbers).

The system will respond with the question: *Which Service?* MicroLink's service name is \*CS followed by A for 300/300 and B for 1200/75.

Next, rather than just pressing *Return* once after \*CSA or \*CSB, you should press it a few times (about six should do). The system will respond with the prompt *Comshare*:

## Direct dial

In reply to this you type the letter T. Again, not just one return but a few (there should be at least three – so do five to be sure).

The next message from the Datec/Comshare system will be *Host Port*. Almost finished now. This will be followed by a message from the Telecom Gold computer itself, the familiar *Telecom Gold Network: For assistance type 'Help Login' at the prompt 'Pad<'*.

Those of you who use direct dial will now know what to do. Type in *Call* then your system number then *Return* (for

MicroLink the system number is 72).

Assuming that there have been no problems along the line, you will be greeted with:

\*\*\* Call connected

Welcome to Telecom Gold's System 72

Please Sign On

*"I've used the  
Canterbury access port  
and I've had no  
problems with it,  
though it was a bit  
slower than PSS and a  
good deal slower than  
direct dial"*

All that remains is to give your mailbox number and password. After that apparently lengthy process (longer than both PSS and direct dial – direct dial consists of only what comes after the *Host Port* message) you will finally have logged on to Telecom Gold/MicroLink.

Next, on to the telex service. A member of MicroLink may, for an extra £10

registration, send and receive telexes. Outgoing telexes to the UK cost 5.5p per 100 characters. Incoming telexes are free, though they used to cost 50p each. There are now two telex numbers to which a MicroLink subscriber may be sent telexes, they are 265871 MONREF G, the old number, and 265451 MONREF G.

## Free mailbox

If you are on Gold and you wish to send a telex to one of these numbers then I have one piece of advice – don't. In full, the telex number will be written as something like this; 256871 MONREF G quoting ref: 72:MAG30190.

The reference part is in fact a Telecom Gold mailbox and it is much cheaper to just E-Mail the person concerned. After all, E-Mail on Telecom Gold is free.

Now, some news of how you can join MicroLink for free. The initial registration fee of £5 will be paid for you by Database itself (you will have to pay the telex registration if required and all your bills though).

How does one qualify for this? Well, regular users of any of the Musictel systems are entitled to one free mailbox. More details will be posted on the Musictel boards or if for some reason they're not contact the sysop of the board who should be able to help you.

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# Midi power without tears

Mark Jenkins with readers' letters and a new Commodore 64 interface

I said I would look at the Casio editing package *CZ-Android* from Hybrid Arts this week, and we now have the *MidiTrack ST* from the same company. Since this has good claim to being the world's most powerful home micro composition system, featuring as it does a SMPTE time code generator to lock micros and synths to video and film equipment, it's a bit on the involved side. So let's ease ourselves into action with a few letters for this week...

N Clarke of Leeds is interested in delving into the mysteries of Midi but says that his local city library can't track down that fascinating document, *The Complete SCI Midi Version*. This contains the world standard specification for Midi input and output commands which you can apply to any micro if you can buy or build an interface to the correct hardware specification (of which more later). The answer to this one is to consult Sequential Circuits directly at PO Box 16, 3640 AA Midjrech, Netherlands.

Robin Lavender of Somerset writes to say that he was much taken by our review of the Cheetah MK5 Midi control keyboard, and now needs to find some inexpensive Midi tone modules to interface with his micro and the Cheetah.

The Korg EX800 which we suggested at the time is discontinued, although there are many about in the shops and on the second-hand market. You shouldn't pay more than around £150 now – the EX800 fits into a 19" rack, plays eight-note polyphonically (four-note for thicker sounds) and has a chorus and built-in step-time polyphonic sequencer which you could program from the Cheetah. Its one slight disadvantage is that it only has one filter, so if you set up a long, twangy noise, all the notes will be filtered in the same way, which is less lifelike than having eight independent filters.

One alternative is Yamaha's FB-01 at around £299. It will play eight-note FM sounds or eight different monophonic sounds or any mixture in between in response to information on any combi-

nation of Midi channels. Very powerful, but all the sounds come out of the same stereo sockets (which limits the sort of effects you can put on the individual sounds) and you can't edit the sounds without a CX5 micro (although you do have a vast selection of presets built-in). The FB-01 MkII is due out soon and apparently this will be editable.

There's also the Roland EM-101 Sound Plus at around £149. Intended as an expander for a Midi piano, it offers



101, which offers miniature keys, eight-note polyphonic "phase distortion" sounds or four different monophonic sounds simultaneously on different Midi channels, for around £230.

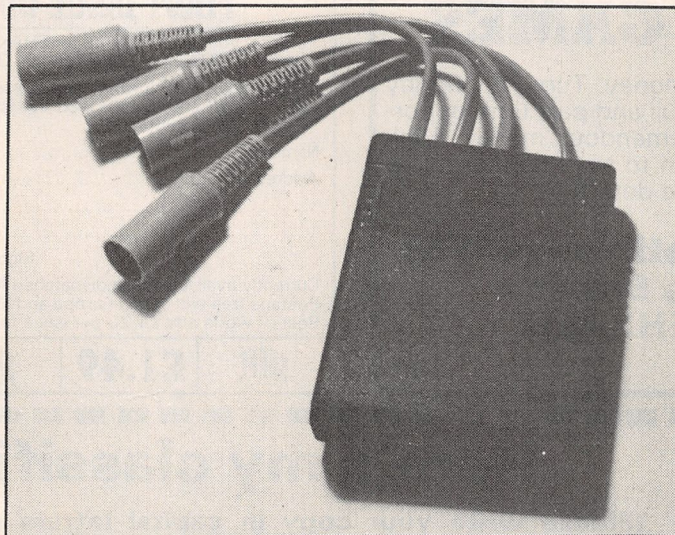
As for where to get hold of all this technology – Robin Lavender in Somerset is going to have a bit of a problem, as I don't know of any high-tech music stores down that way. His best bet may be a visit to Bristol to Duck, Son and Pinker at 6/9 The Arcade (0272 211596) which stocks Yamaha, Korg and Sequential; or to Freeway Music at 80 North Street (0272 660734) who stock a wide selection of keyboards and synthesisers including second-hand equipment.

Back to the subject of Midi for a look at the Datel Interface, a new product for the Commodore 64 which takes up where Siel and Jellinghaus seem to have left off. The Interface simply fits into the cartridge port of the C64 and has four trailing Din sockets for Midi In, Midi Thru, and Midi Out 1 and 2. The two outputs are identical but allow you to connect two instruments which don't have Thru ports, which is handy, and the

clock frequency of the port is crystal-controlled as specified by the Midi standard.

The Datel Interface (£24.99) doesn't come with any software, but is claimed to be compatible with all existing Siel and Jellinghaus software (which doesn't seem to have a UK importer at the moment) as well as with Rainbird's *Advanced Music System*. I tried it out with *C-Lab Master Tracks*, still the best C64 program around, and it worked fine, which presumably indicates that it will also work with the Steinberg Pro-24 and its associated Score Writer package. If you have a C64 and haven't thought of using it for Midi control yet, now's your chance.

Datel Electronics, Units 8-9 Fenton Industrial Estate, Dewsbury Road, Fenton, Stoke-on-Trent, 0782 273815.



The Datel Interface for the Commodore 64

strings, brass, pianos and a handful of other pre-set polyphonic sounds, some monophonic synth voices such as bass and cello, a Midi split facility so that it only responds to notes below a certain point on your programming keyboard, velocity response and tone control plus stereo outputs. It seems to have been discontinued now, but again is in stock in several shops.

More ambitiously there's the Roland MKS-7 which has a load of sampled drum sounds, two polyphonic sections with pre-set sounds, a monophonic section and completely independent outputs with level controls. It's around £900, but was designed to work with Roland's Muse composition software for the Apple II and so could be the ideal compact sound generator for any micro-based system.

But one synth with a keyboard still remains a bargain – that's the Casio CZ-



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# New Releases

John Cook looks through this week's new arrivals

## Amiga

**Program Silicon Dreams Type** Graphic Adventure **Price** £19.95 **Supplier** Rainbird Software, 74 New Oxford Street, London WC1A 1PS.

**W**orthy package of three old Level 9 adventures, *Snowball*, *Return to Eden* and *The Worm in Paradise*. Great value for newcomers to the field, but more experienced campaigners might want to wait for their new title *Knight Orc* which is beginning to sound like what *Lord of the Rings* should have been.

## Amstrad PCW

**Program MedSpell Type** Application **Price** £19.95 (stand alone) £54.95 (including LocoSpell) **Supplier** MedStat Ltd, City House, Maid Marian Way, Nottingham NG1 6BH.

**L**ocoSpell has the facility to add on specialised dictionaries to the main general database – and here is one, if you are of a medical bent.

16,000 specially chosen medical terms, all very useful if you are writing scientific/medical reports – or particularly lurid novels.

**Program Tau Ceti Type** Arcade Adventure **Price** £19.95 **Supplier** CRL, CRL House, 9 Kings Yard, Car-

penters Road, London E15 2HD.

**T**he Spectrum classic now on the PCW, and very nicely, too. Your task, as before on the post-plague planet, is to neutralise the automatic defence systems of *Tau Ceti*, so the planet can be recolonised. Green and silent as a puppet without a hand up its bottom, but PCW owners will love it.

## Amstrad CPC

**Program MGT Type** Arcade **Price** £9.99 (tape) £14.99 (disc) **Supplier** Loricels, via Activision, Activision House, 23 Pond Street, London NW3 2PN.

**H**aven't seen this yet, but they say that your final destination is the room of enlightenment. Hey! Wow! And put those joss sticks out.

**Program Ninja Type** Arcade **Price** £1.99 **Supplier** Mastertronic, 8-10 Paul Street, London EC1.

**M**artial arts quest – slightly similar to *Karateka* maybe – only much cheaper.

**Program Flyspy Type** Arcade **Price** £1.99 **Supplier** Mastertronic, 8-10 Paul Street, London EC1.

**Program TT Racer Type** Simulation **Price** £9.95 (tape) £14.95 (disc) **Supplier** Digital Integration, Watchmoor Trade Centre, Watchmoor Road, Camberley, Surrey GU15 3AJ.

**A**t last! *TT Racer* on the CPC! Hold on a moment – do you want the good news or the bad news. The good news is that Amstrad *TT Racer* is much more colourful than the Spectrum version, yet retains the technical authenticity and a measure of the multi-station play (you can connect two CPCs together).

The bad news is that the Amstrad has yet to see a program that combines this

Pick of the week

## Race to the top

**Program Enduro Racer Type** Arcade **Micro** Spectrum **Price** £9.99 (tape) £14.99 (disc) **Supplier** Activision, 23 Pond Street, London NW3.

**O**n the whole, I tend to find coin-op conversions just a little disappointing. Working in the depths of the seedy West End (as we do) a ten minute walk can take you to most of the major arcades, and having played the all-singing, all-dancing version, on a home computer they often look a little off in direct comparison. Imagine the bliss and rapture expressed, then, when I found a program that delivers all the speed and playability of its big brother. That program is, amazingly, *Enduro Racer* – even more amazingly on the Spectrum.

This program has so many bests it's difficult to know where to start. Best and fastest scrolling on a racing game. Best sprite design. Best playability. Best coin-op conversion.

If all that sounds a little over the top, just wait until you have a chance to play it. The game possesses that elusive quality that catches you from the moment you pick up the joystick. You are there, or that trial hike, throttle wide open, scrambling for grip. All you'd need for full simulation at the desert sequence is a hair drier and a bucket of sand.

Racing game par excellence, *Enduro Racer* is the best coin-op conversion available for the Spectrum. If this doesn't make it, there's no hope for us. Start saving for March.

kind of in depth, technical approach, and realism, in terms of playability.

Quite simply, the scrolling is not fast enough to give substance to the illusion that you are at the controls of a performance bike.

Not a classic by DI's high standards – and the fact that it still is the best program of its kind on the CPC only points to a gap in the market that has yet to be filled.

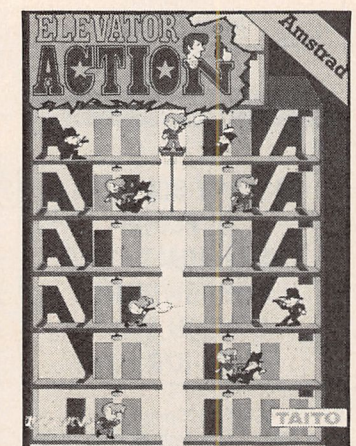


**Program Elevator Action Type** Arcade **Price** £8.95 **Supplier** Quicksilver, Argus Press Software, Victory House, Leicester Place, London WC2H 7NB.

**R**easonable coin-op conversion by the Quicksilver team.

**Program Wibstars Type** Arcade/Strategy **Price** £8.95 **Supplier** A&F, Argus Press Software, Victory House, Leicester Place, London WC2H 7NB.

See Spectrum for comment.



**Program Ultra Mon Type** Utility **Price** £14.99 (disc only) **Supplier** Bubble Bus Software, 87 High Street, Tonbridge, Kent TN9 1RX.

**S**ophisticated CPC machine code monitor with the unusual ability to load and save Spectrum programs, particularly useful if you are into conversions. All the normal functions you'd expect are there, too, and if





you think the instruction booklet is a bit rough and ready (at 40 folded A4 pages) – remember, at £14.99 this is one of the bargains of the year.

## Atari ST

**Program** *Ninja Mission* **Type** Arcade Adventure **Price** £9.95 **Supplier** Mastertronic, 8–10 Paul Street, London EC2.

**C**onversion of the budget title *Ninja* on to the ST. Not a state-of-the-art martial arts bash, almost like an arcade adventure (say *Karateka*) as you make your way through screens of bad guys that can be bopped on the head with the sword, kicked to death, or punctured by those cute ninja stars that seem to be standard issue at football matches these days.

Colourful backgrounds, neat music in between screens (which take rather too long – five seconds or so – to appear), accessible gameplay. Not a classic, but at the price you'll not be disappointed.

**Program** *MI-Print* **Type** Utility **Price** £19.95 **Supplier** Microdeal, Box 68, St Austell, Cornwall PL25 4YB.

**B**asic utility for printing out text files, giving you control over margins, page numbers, header, line spacing, etc.

**Program** *The Sprite Construction Kit* **Type** Utility **Price** £19.95 **Supplier** Microdeal, PO Box 68, St Austell, Cornwall PL25 4YB.

**D**esign and animate those sprites within a Gem en-

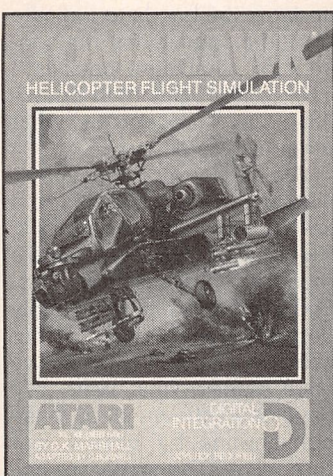


vironment – review coming to this magazine soon.

## Atari XL/XE

**Program** *Tomahawk* **Type** Helicopter Simulation **Price** £9.95 (tape), £14.95 (disc) **Supplier** Digital Integration, Watchmoor Trade Centre, Watchmoor Road, Camberley, Surrey GU15 3AJ.

**C**reditable conversion job of DI's tricky helicopter/combat simulation.



## Dragon 32

**Program** *Stone Raider II* **Type** Arcade **Price** £5.95 **Supplier** Microdeal, Box 68, St Austell, Cornwall PL25 4YB.



**Y**es, the Dragon is still going, although the flow of commercial software has all

but dried up.

This one's a *Boulderdash* variant – but none the worse for that. And yes, it has got quite a lot of green in it.

## Commodore 64

**Program** *Cyber 1* **Type** Arcade **Price** £2.99 **Supplier** Super Sparklers, Creative Sparks Publishing, Unit B11, Armstrong Mall, Southwood Summit Centre, Southwood, Farnborough, Hants GU14 ONP.

**Program** *Gunship* **Type** Simulation **Price** £14.95 (tape) £19.95 (disc) **Supplier** Microprose Software, 2 Market Place, Tetbury, Glos GL8 8DA.

**M**icroprose consistently produces polished, well implemented simulations/games, and its newest, *Gunship*, is no exception.

You are in control of an AH-64A Apache Helicopter (just like in Digital Integration's *Tomahawk*) with the objective of, what else, blowing those green gooks aaaaaaaway.

Operation of the helicopter is tricky – although not quite as complicated as *Tomahawk* – but this is simplified by a comprehensive keyboard overlay.

Detailed instrumentation, four weapon systems, four different areas of operation (from Nam to Western Europe) and three skill levels, and with each mission, depending on the outcome, you might get promotion of decoration. On the other hand, you might just get shot out of the sky.

Comparisons between *Tomahawk* and *Gunship* are going to be inevitable (particularly as we are going to be doing a head-to-head review next week) – but right now it looks like *Tomahawk* might just have the edge simulation wise, whereas *Gunship* wins on presentation and playability. For the definitive guide, we'll put in the flying hours and reveal all next week.

**Program** *Wibstars* **Type** Arcade/Simulation **Price** £8.95 **Supplier** A & F, Argus Press Software, Victory House,

Leicester Place, London WC2H 7NB.

## Spectrum

**Program** *Smudge and the Moonees* **Type** Arcade **Price** £1.99 **Supplier** Sparklers, Creative Sparks Publishing, Unit B11, Armstrong Mall, Southwood Summit Centre, Southwood, Farnborough, Hants GU14 ONP.

**Program** *Super Shuffle* **Type** Fruit Machine Simulation **Price** £1.99 **Supplier** Sparklers, Creative Sparks Publishing, Unit B11, Armstrong Mall, Southwood Summit Centre, Southwood, Farnborough, Hants GU14 ONP.

**I**'ve never quite understood the appeal of a fruit machine simulator – I thought that any excitement gained from playing one arm bandits was from risking the hard earned pennies. Still, as the song goes, 'If you want it, here it is...'

**Program** *Wibstars* **Type** Arcade Simulation **Price** £8.95 **Supplier** A & F, Argus Press Software, Victory House, Leicester Place, London WC2H 7NB.

**B**ig in-joke here, industry lovers. There used to be a software distribution company call Websters (ceased trading long since). So some marketing hero has decided that it would be great fun to set up an arcade game called *Wibstars* and include elements loosely based on software distribution. Wacky, eh, funsters.

Doomed to failure from the very beginning by such an appalling design concept – the programmers, although delivering a technically competent title, were completely uninspired when it came to the job.

I haven't seen graphics like this since *Jet Set Willy* and what this is doing outside a budget label is quite beyond me.

Unless you feel like blowing nine quid on some whimsical nostalgia trip, forget it.



## Terms of estrangement

I have a problem with computer jargon. Not with words like 'standard', which is to a computer manufacturer what 'manifesto promise' is to a politician.

Nor with acronyms like Basic - which describes the process of turning a problem into a program, ie, Brainstorm, Analyse, Solve, Implement, Crash; or Wysiwyg - which describes certain types of word processor, ie, Wish You'd Saved It When You'd Gone - and - deleted - the - only - copy - of - the - third - chapter - of - your - novel.

I can take terms like OEM - Original Equipment Manufacturer - which actually means Company That Takes Manufacturers' Equipment And Passes it Off As Its Own, Under Agreement. But CTTMEAPIOAIUOA isn't all that snappy.

I can even cope with nomadic definitions like VDU which once referred to a terminal that uses a monitor for output instead of the old-fangled teleprinter, but now, thanks to certain journalists, simply means a monitor.

No, my problem is with terms that mean all things to everybody and nothing to anybody.

Terms to be used in some semantic conjuring trick where the glibness of the mouth deceives the mind. Terms like 'fifth generation'.

Since every time a manufacturer like Apricot, Apple or Atari announces a new machine, it runs down previous machines and then de-

clare this one to be the first of the next generation, how can the Japanese be so confident that we'll still only be at the fourth by the time they're ready to launch their great leap into an oriental darkness?

What on earth does 'artificial intelligence' mean? What makes it so artificial, anyway? If it means phoney, then we have that already. All you need is a program that responds to questions with a random selection from a list of obscure chinese proverbs. You know the sort of thing, the world is like a bowl of rice, it is better to be rich and well than to be poor and dead, never provoke a Dragon when Jupiter is in conjunction with a Pluto graphics board (the casing might melt). Philosophers have been plying us with that kind of guff for centuries.

Maybe the term artificial is used to indicate that it is not natural intelligence. But since computers are not natural objects, any powers they may possess must be artificial. Either a machine/software combination is intelligent or it isn't, why bother with labels like artificial? It's no more helpful than calling a colour artificial yellow.

Having disposed of artificial, we now come to the big one. What is meant by intelligence?

Once we might have said that it meant to respond to various spoken instructions - but a computer can do that with the right interface. Or

applying a particular skill - but computers now fly aeroplanes (it's true that they need to be told exactly how to in a program, but then so do pilots. The only difference is in the language used.) Computers can devise flight plans and even micro chips that are too complicated for humans alone to produce.

"Yes, but", you may say, "all of this may be true but a computer cannot actually understand what it is doing. It may run a program that draws a clock on the screen and then updates the hands to indicate the time, but it has no concept of what time itself is." This is true. But then do we have any concept of what time really is either?

We rarely use concepts, instead we reduce reality to a set of rules or conventions. This is the way we handle most of the world around us. Six is greater than five simply because, according to our scheme of mathematics, we have made it that way. We have been shown all of these conventions by others, our forebearers, so surely we can convey these same conventions to computers in a language that they use.

The trouble with jargon phrases like "artificial intelligence" is that, whilst we can baffle friends and colleagues alike with our conversation, we can also use this same gibberish to obscure the issues and to confuse ourselves.

Gareth Briggs

## NEXT WEEK

### US databases

Ben Knox surveys what the US networks have to offer the communications enthusiast, and how to access them.

### Atari ST graphics tablet

New from Eidersoft, a graph pad package comprising the tablet, pointer device, stylus and software. We draw our conclusions.

### Reviews

Head to head in a helicopter dog-fight between the Commodore versions of *Gunship*, new from Microprose, and *Tomahawk*, conversion of Digital Integration's acclaimed title.

### Rockfall

A tricky graphically appealing game for the Commodore 64 for you to type in and play.

*Popular Computing Weekly* - don't leave the shop without it!

## Hackers





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